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# A MONOGRAPH

OF THE

# NORTH AMERICAN PHORIDÆ

BY

CHARLES THOMAS BRUES.

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# A MONOGRAPH OF THE NORTH AMERICAN PHORIDÆ.

BY CHARLES THOMAS BRUES, M. S.

The present work was begun several years ago, by Prof. J. M. Aldrich, of the University of Idaho, by whom all the material was collected. At that time a number of the new species were described, but owing to work on his catalogue of the North American Diptera, Professor Aldrich was compelled to discontinue work on the Phoridæ. At his suggestion, the collection was sent on to me, together with the descriptions of new species already prepared. In the text I have placed such descriptions in quotation marks and the initials J. M. A. after them in parentheses. This signifies that the original description was drawn up by Professor Aldrich.

The material was derived from various sources. A large portion of it was collected by Professor Aldrich in Dakota, Idaho, and at Lawrence, Kans. A large number of the eastern species were collected by Mr. C. W. Johnson, and many from the middle west by Dr. William M. Wheeler. Acknowledgments are also due to Dr. Garry de N. Hough for many eastern and southern forms, to Mr. A. L. Melander for Texan species, to the National Museum for the loan of some types, to the University of Kansas, Stanford University and Cornell University. Specimens have also been obtained from Dr. Nason, Dr. Kertész and Mr. Trevor Kincaid. The West Indian forms were loaned by the British Museum.

I have examined the types of Loew's species in the Museum of Comparative Zoology at Cambridge, the types of Prof. Aldrich's West Indian species (loaned by the British Museum), as well as the types of some species described by Coquillet and those by Lintner and Felt. An European collection identified by Strobl has been a great help in detecting the identity of certain American and European species.

A set of types of the new species described have been placed in the U. S. National Museum.

In conclusion I wish to express my most sincere thanks and appreciation to Prof. Aldrich for his many valuable suggestions and criticisms, as well as for his generosity in placing the collection in my hands.



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The family Phoridæ form a very readily recognized group of flies. All are of minute or rather small size and extremely active. They separate themselves sharply from other Diptera by their peculiar antennæ and wings; the former consist of apparently a single joint which bears a long three jointed arista; the wings are provided with two distinct kinds of veins,—a series of very thick ones anteriorly, which reach only half way to the wing tip, and a series of three or four much lighter veins, which pursue a longitudinal course and are distributed over the discal portion of the wing.

There are known at the present time about one hundred and twenty five species from various parts of the world. Of these about one-half are described from Europe alone, while the greater portion of the remainder belong to the North American Fauna. There is a close connection between the European and American species, many of them being common to both continents. From the large number of species that are found in every locality which is carefully examined, it is probable that the number of living forms is greatly in excess of those at present known, perhaps four or five times as great. Some of the well known species have a very wide distribution. A few of the forms originally described from Europe have since been found in practically all parts of the holarctic region. A wide distribution seems also to be the rule among the few tropical species which I have examined.

The members of the family are all small and many of them have a more or less hump-backed appearance, due to a great development and arching of the thoracic dorsum. The head is more or less rounded or hemispherical in shape; the compound eyes are well separated above and on the front, while the ocelli, which are absent only in some wingless forms, are placed in a triangle on the vertex. The front, which is from one-half to one-fifth the width of the head, is nearly always (except *Gymnophora* and *Platyphora*) provided with several transverse rows of strong marochætæ or bristles. The antennæ are placed in cavities at the lower edge of the front, their insertion varying greatly on account of the extreme difference in the length of the front in the various species. The antennal cavities are sometimes more or less coalescent, but usually remain separated as lateral depressions. The antennæ are composed of three joints; of these the first is exceedingly small, and the second is enclosed in the third, so that under an ordinary hand lens they

appear as single-jointed. The third joint is very large and generally sherical or oval in form, although in some genera (*Conicera*, *Hypocera* and *Melaloncha*, etc.) it may be elongated and drawn out into a point. The arista is composed of two short basal joints and a long, usually more or less plumose third joint; its insertion may be either dorsal or terminal. The palpi are nearly always large and clavate, with a series of strong bristles along their outer margin. In the males of some species the palpi are much enlarged, or they may be destitute of the characteristic bristles. The proboscis is usually of moderate size and soft consistency; in some forms, however, it is very strongly chitinized, and in a few others it is greatly elongated or swollen.

The thorax is well developed in the winged forms, and is often considerably arched above, so as to partly conceal the head; again, in the wingless females of some genera it is exceedingly small and often shorter than the head. The dorsum usually bears macrochætæ along the sides, medially behind and on the scutellum. The metathorax is very short.

The legs are large and strong and well adapted to jumping. The anterior coxæ are much elongated and more or less freely movable at the base. The four posterior ones are connate with the thorax. The femora, especially the hind ones, are often exceedingly stout and flattened. The tibiæ of all the legs may bear either rows of setulæ or large, strong, single, paired or serial macrochætæ on the outer side before the apex. Often part of the tibiæ and metatarsi are covered with close comb-like rows of flattened bristly hairs. These are very characteristic of the Phoridæ. Tibial spurs and tarsal claws are usually present, although the former may rarely be absent. The empodia and pulvilli are nearly always present, but are wanting in a few of the genera. Peculiar modifications of the legs are rare, and when they do occur apply only to the tarsi and femora. The femora may be extremely flattened, and the tarsi may be flattened or swollen. The wings are present in the males of all genera so far as is at present known, but are absent or very much reduced in size in the females of quite a large number of the genera. Their unique venation when present serves at once to distinguish them from any other known Diptera.

The wings are large and are folded flat on the back when not in use. The costa is thickened along its basal half to form

the costal vein. Below this is the first longitudinal, which remains separated from the costa until near its tip, where it curves upward and meets the costal vein; near the base of the wing it is connected with the costa by the short humeral cross-vein. Just beyond it and anterior to the first vein is the mediastinal or auxiliary vein, which is often obscure or completely absent in some forms. The third vein is usually quite stout, and meets the costa at its apex. The second vein is short (absent in many forms), and is an anterior branch of the third. It usually meets the costa near the tip of the latter. The costa is bristly except in a very few cases, as is also the root of the wing behind. The four discal veins are usually considered as the fourth to seventh longitudinal veins, and are always more delicate than the basal veins; occasionally the last (seventh) may be absent. As a rule, the wings are hyaline or but slightly colored, but in some few European species the anterior border is strongly infuscated. Peculiar wing pores have been described, which are upon the apical portion of the third vein.*

These pores are very numerous in *Phora pachyneura* Lw., in which case they extend over the apical three fourths of the third vein. The females of many genera have more or less vestigial wings. In such cases the venation is obscured or obliterated, and the wings often assume grotesque forms or are ornamented with enormous bristles (*e. g.*, *Acontistoptera* and *Xanionotum*); in another group of genera the females are completely destitute of wings. Even the halteres are wanting in some wingless females.

The abdomen is of the usual form, generally more or less conical in the female, and often with a conspicuous hypopygium in the male. The ovipositor of the female is generally soft and delicate,

* The following remarks upon the wing pores are from Felt, 10th N. Y. Rept. "An additional character which may prove to be of specific value is found in the number and location of certain 'pores' or pore-like structures. The pores, four in number (*i. e.*, in *Aphiochæta albidohalteris*), occur in a slightly curved row along the middle on the outer side of the second heavy vein, where it anastomoses with the costal vein; a short stump extends beyond the anastomosis and inclines a little away from the costa.

"The pores are less than half their diameter apart, the last one being close to the apex of the stump. Each consists of a depression, surrounded by a raised circular ring of chitin. These pores must not be confounded with the scars on the costal vein when a bristle is removed; they appear to have no connection with either bristles or setæ."

but in some forms (*e. g. Apocephalus, Melaloncha*) it is strongly chitinized and adapted to piercing.

The adult flies are very active and make but little use of their wings, using them only to fly for short distances. When in motion they run about with a peculiar jerky, hopping motion which makes them readily recognizable at a glance. They may often be captured in sweepings from damp places, or running about on the ground among decaying leaves or near carrion. Very often they may be seen on windows. The numerous species which are parasitic on ants are usually seen only in or about the nests of their hosts.

The anatomy and transformations of the Phoridæ have never been described with any amount of detail. I give below the description of a larva which is a species of Phora that was found by Hubbard in the Mammoth Cave, Kentucky.

The larva is cylindrical, narrowed in front, more suddenly narrowed behind. Head small, rounded, convex, deeply inserted in the thorax; above, on each side, an acute, three-jointed tubercle; in front, a second pair of very minute tubercles, separated by a sutural line, which branches below them; space between the branches of the Y-shaped sutures excised, inclosing the buccal opening, which appears as a dark transverse slit. Three thoracic segments smaller than the abdominal segments, retractile, bearing at or near the anterior border a row of acute tubercles or spines; the prothoracic with a pair of tubular spines arising from depressions at the middle of each side. Abdomen of nine segments, each with three folds on the dorsal surface, the posterior fold bearing a row of spines, similar to those on the thorax; sides wrinkled, with tubercular prominences between the segments, and one or two spines anterior to those of the dorsal row; ventral surface, each segment with three tranverse ridges, one median, slightly in advance of the two lateral ridges; the last segments smaller, the terminal with an anal projection consisting of two large retractile tubercles, directed upward, and bearing spiracles, surrounded by six radiating spiny processes. Color dull white, darker at the extremities. The pupa is visible through the skin of the larva, which becomes an indurated puparium, light red in color, oval, pointed at the ends, smooth and convex beneath, more depressed on the dorsal surface, which is margined, with the segments indicated by ridges. The extremities of the puparium show the parts of the larva unchanged.

It appears from De Meijere's account (1901) that the larva of Lonchoptera, although quite different in external form from that of Phora, resembles it in many ways. Osten Sacken (1902) has also recently given reasons for considering the Phoridæ and Lonchopteridæ rather closer to the families included in his superfamily *Energopoda* than to any other Diptera. He states specifically, however, "A real *affinity* with *Phora* does not exist anywhere." De Meijere thinks, from a study of the larva of *Lonchoptera*, that the

latter should be placed as a family of Cyclorrhapha, close however to the Orthorrhapha. I have no evidence to add in support of either of these views, but am firmly convinced, from a study of the mouth-parts and head of *Lonchoptera* and *Phora*, that the two forms are more closely allied than has generally been supposed.

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In the following list I have endeavored to give a number of the species of Phoridæ whose habits have been at least to some extent observed.

GENERAL.

Phora living in caves. Packard, Am. Nat., V, 1871, 745.
Also, Aldrich, 1896. (Probably *microcephala* Lw.)

Foul brood due to *Phora*. Bethune, 16th Rept. Ent. Soc. Ontario, 1886, 30,

Phorid larvæ emerging from a hornet after its death. (Verrall.)

SPECIFIC.

**Phora bergenstammi** Mik. In putrid snails (Mik).

**Phora microcephala** Lw. Lives on dead caterpillars, but is not a true parasite. (Hubbard and Riley.)

**Phora opaca** Meig. On exhumed human bodies.

**Phora cimbicis** Ald. Bred from cocoons of *Cimbex americana*.

**Hypocera incrassata** Meig. Parasite of honey-bee larva in England and cause of foul brood (Packard, 1868).

**Aphiochæta agarici** Lint. On decaying mushrooms (Lintner).

**Aphiochæta epeiræ** Brues. Bred from egg cocoons of the spider *Epeira* (Brues).

**Aphiochæta fasciata** Fall. In coccinellidæ which were feeding on *Aphides* (Rondani).

**Aphiochæta flava** Fall. Larvæ in *Agaricus* (Schiner).

**Aphiochæta fungicola** Coq. Bred from larvæ infesting fungi (Coquillet).

**Aphiochæta lutea** Meig. Larvæ in *Agaricus* (Schiner).

**Aphiochæta minuta** Ald. Bred from cocoons of *Cimbex americana* (Aldrich). In mushrooms (Howard).

**Aphiochæta nigra** Meig. In *Agaricus prunulus* (Schiner).

**Aphiochæta pulicaria** Fall. In nest of *Vespa germanica* (Van der Wulp). From *Agaricus* (Schiner),

**Aphiochæta rufipes** Meig. Quite a general feeder, Brunetti, Ent. Month. Mag., xxv, 1889, 282. In nest of *Vespa germanica*, Newstead, Ent. Month. Mag., xxvii, 1861, 41. From larvæ of *Nematus salicis* (Fitch).

**Conicera atra** Meig. On exhumed human bodies. On corpse, two years after burial, Webster (1890).

**Trineura aterrima** Fabr. On buried human bodies (Mégnin, 1895).

**Apocephalus pergandei.** Larvæ parasitic in the heads of adult ants (*Camponotus*). Their presence causes the ant's head to drop off. Habits carefully described by Pergaude (1901).

**Syneura cocciphila** Coq. Bred from larvæ infesting head of adults of *Icerya purchasi* (Coquillett).

Pachyneurella venata Ald. On dead shells (H. H. Smith).
Platyphora lubbocki Verrall. Myrmecophilous (Verrall).
Melaloncha (?) formicarum Verrall. Myrmecophilous (Verrall).
Psyllomyia testacea Lw. Myrmecophilous with *Dorylus*.
Commoptera solenopsidis Brues. Myrmecophilous with *Solenopsis geminata* (Brues).
Ecitomyia wheeleri Brues. Myrmecophilous with *Eciton*.
Ænigmatias blattoides Meinert. Myrmecophilous (Meinert).
Acontistoptera melanderi Brues. Myrmecophilous with *Eciton opacithorax*.
Xanionotum hystrix Brues. Myrmecophilous with *Eciton* spp.
Puliciphora lucifera Dahl. On flowers of giant *Arum* that smell like carrion.
Wandolleckia cookii. On land molluscs (*Achatina*), Cook.

It is evident, therefore, that the larvæ of many species live in decaying matter of a vegetable and animal nature; others are myrmecophilous, while a few have been observed as true parasites.

## TABLE OF GENERA.*

1. Wings fully developed.....2.
   Wings absent or much reduced in size and venation.....14.
2. Third longitudinal vein forked near apex.....3.
   Third longitudinal vein simple, at most thickened at apex.....6.
3. Costal vein and front destitute of setæ.....**Gymnophora.**
   Costal vein and front provided with stout setæ.....4.
4. Anterior frontal setæ reclinate, middle tibiæ with one or more setæ on the outer side near the base.....5.
   Anterior frontal setæ reclinate, middle tibiæ destitute of such setæ, ovipositor hard and polished.....**Apocephalus.**
   Anterior frontal setæ proclinate, middle tibiæ destitute of such setæ. **Aphiochæta.**
5. Mediastinal vein present, proboscis normal, not greatly elongated..**Phora.**
   Mediastinal vein obsolete, proboscis of female very long and slender, pulvilli absent or obsolete.....Dorniphora.
6. Front wholly destitute of bristles.....Platyphora.
   Front provided with bristles.....7.
7. First longitudinal vein wanting.....**Ecitomyia** male.
   First longitudinal vein present as usual.....8.
8. Anterior frontal setæ reclinate, middle tibiæ with one or more setæ on the outer side near the base.....9.
   Anterior frontal setæ proclinate, middle tibiæ without such setæ.....12.
   Anterior frontal setæ absent, third antennal joint spherical, legs with no bristles except tibial spurs.....Chonocephalus, male.
9. Velvet black, middle tibiæ of the male with a row of long setæ on the upper side.....**Trineura.**
   Not velvet black, middle tibiæ with only two or three setæ besides those at apex.....10.

* Genera from all parts of the world are included in this table, the ones represented in North America being printed in heavier type.

10. Tibiæ with bristles on the outer side before the apex.....11.
Middle tibiæ without bristles before the apex, hind tibiæ fringed above with bristles.....Melaloncha gen. nov.

11. Male antennæ prolonged into a slender point, with apical arista. Female antennæ with a slight point where the arista is inserted at upper corner, seventh vein obsolete.....**Conicera.**
Third joint usually rounded in both sexes, seventh vein distinct.
**Hypocera.**

12. Tibial spurs present on four posterior legs, well developed, hind tibiæ delicately spinulose.....**Syneura.**
Tibial spurs present only on hind legs.....**Puliciphora** male.
Tibial spurs absent or obsolete, legs bare.....13.

13. Fourth, fifth and sixth veins light.....**Metopina.**
Fourth, fifth and sixth veins heavy.....**Pachyneurella** gen. nov.

14. Wings or halter-like appendages present, although of small size.....18.
Wings completely absent.....15.

15. Body when seen from above oval, cockroach-like...**Enigmatias** female.
Body when seen from above constricted into the usual three parts.....16.

16. Abdomen of uniform texture, without more heavily chitinized dorsal sclerites, ocelli absent.....Wandolleckia, female.
Abdomen with four or more conspicuous, heavily chitinized dorsal sclerites, surrounded by a thinner membrane.....17.

17. Ocelli absent, also ocellar machrochætæ, abdomen with six dorsal sclerites, and one ventral one, the sixth.....Chonocephalus, female.
Ocelli present, four dorsal abdominal sclerites.....**Puliciphora,** female.

18. Abdomen much swollen, the last three segments small and directed forward under the basal ones.....Termitoxenia.
*a.* Arista simple, finely pubescent, thoracic appendages straight, club-shaped and flattened, oviparous.....sub-gen. Termitoxenia.
*b.* Arista branched, not pubescent, thoracic appendages poorly developed, hoe-shaped or styliform; viviparous.....sub-gen. Termitomyia.
Abdomen often swollen, but of normal form; posterior segments never directed forward.....19.

19. Proboscis longer than the head and geniculate, abdomen fully chitinized throughout.....Psyllomyia, female.
Proboscis shorter than head height, abdomen at least in part membranous..20.

20. Wings very small, strap-shaped; often bearing long bristles.....21.
Wings larger, indistinctly veined, more or less triangular in shape.
**Commoptera,** female.

21. Wings not bearing long bristles, abdomen without large macrochætæ.
**Ecitomyia,** female.
Wings with very long bristles, head much wider than thorax, abdomen often with large macrochætæ.....22.

22. Head transversely arcuate, abdomen bare, wing bristles very long and stout.
**Acontistoptera,** female.
Head sub-triangular, abdomen with many very long macrochætæ arranged in transverse rows.....**Xanionotum,** female.

**PHORA** Latr.

1804. Latreille, Hist. Nat. des Ins. et Crust., 1804, XIV, 394.
1794. Fabricius, Ent. Syst. IV, *Musca, Tephritis, Bibio.*
1823. Fallen, Phytomyzides, *Trineura.*
1804. Meigen, Classif. I, *Trineura.*
1830. Meigen, Syst. Beschr. VI, *Phora.*
1848. Zetterstedt, Dipt. Scand., *Trineura.*
1856. Rondani, Prodromus, I, 136, *Palpimega, Megaselia, Triphleba.*
1861. Lioy, Atti. Inst. Venet., 1864, *Phora, Trisometopia.**
1901. Becker, Monog. Phoridæ, 6.

## GENERIC CHARACTERS.

Body rather stout, thorax and abdomen stout, well developed. Abdomen with six segments besides a large hypopygium in the male, and a three-jointed exsertable ovipositor, which is never strongly chitinized or horny in the female. Head hemispherical, the front usually broader than long, with four transverse rows of bristles, all of which are reclinate; upper three rows each consisting of four bristles, lower row with only a single median pair. Eyes widely separated, more or less pubescent; ocelli present. Cheeks and palpi bristly, the latter often enlarged in the male and less bristly than in the female. Third antennal joint spherical or egg shaped, with dorsal arista. Legs stout, the hind femora usually thickened. Hind tibiæ almost always with from one to seven stout macrochætæ on the outer side before the apex, spurs present on the four hind tibiæ. Wings large, mediastinal vein distinct, third longitudinal vein forked near the apex, costal vein bristly, posterior wing margin bristly at the root of the wing.

### *Table of Species.*

1. Wings with four delicate longitudinal veins ..... 4.
   Wings with only three distinct light veins ..... 2.

* The species which Lioy chose as type for the genus *Trisometopia* according to Becker's identification belongs to the present genus in which all the frontal bristles are reclinate. From Lioy's description one would be inclined to place it elsewhere, but I have placed it here, as the type designated by Lioy belongs to this genus. From the aggregation of types which Lioy indicates for the genus *Phora*, it is evident that he either had a very confused idea of the characters of the species enumerated or was working with wrongly determined specimens. The first, *P. flavicornis* Macq., = *maculata* Meig., is a true Phora; the second, *P. fuliginosa* Meig., is a synonym of *Gymnophora arcuata* Meig., and some of the others belong to other genera.

2. Third longitudinal vein black, much thickened, at its middle stouter than the costal vein; hind tibia with no seta on outer side near base. **pachyneura** Lw.
   Third longitudinal vein fuscous, not unusually thickened ..... 3.
3. Fourth vein recurved at the tip, ending as far from the wing tip as the fifth. **microcephala** Lw.
   Fourth vein straight at apex, ending much closer to the wing tip than the fifth. **fratercula** sp. nov.
4. Thorax with a single pair of dorsocentral macrochætæ ..... 5.
   Dorsum with two pairs of dorsocentrals ..... **comstocki** sp. nov.
5. Halteres black ..... 6.
   Halteres yellowish or white ..... 8.
6. First, second and third veins ending very close together ..... 7.
   First and second veins far apart at apex as usual, costal cilia long. **grœnlandica** Lundbeck.
7. Front very coarsely punctured throughout ..... **cimbicis** Ald.
8. Hind tibiæ with four or more setæ on outer side, besides the apical spurs .. 9.
   Hind tibiæ with never more than three setæ on the outer side before the apex. These when present very strong ..... 13.
9. Setæ on hind tibiæ four or five in number, very fine and slender, not as long as the width of the tibia ..... 10.
   Setæ on hind tibiæ very long and unusually stout, equalling the apical spurs in size ..... 11.
10. Legs and pleuræ yellowish ..... **incisuralis** Lw.
    Legs and pleuræ black or piceous ..... **nitidifrons** sp. nov.
11. Front tibiæ with two serial unpaired setæ near the middle of the outer side, posterior tibiæ usually with seven or more long setæ, abdomen wholly black ..... **spinipes** Coq.
    Front tibiæ with a single seta on outer side before the apex ..... 12.
12. Hind tibiæ with five long setæ on the outer side, the first two being paired and the others serial, abdominal segments with narrow, pale apical borders* ..... **scutellata** sp. nov.
    Hind tibiæ with four setæ, a pair at basal third, one at apical third and one just before the tip. Abdomen black ..... **thoracica** Meig.
    Hind tibiæ with a pair at basal third and a pair just before the tip. **luggeri** Ald.
13. Hind tibiæ with one or more stout setæ on outer side before the middle .. 14.
    Hind tibiæ destitute of such stout setæ on outer side before the apex ..... 17.
14. Hind tibia with one stout seta on outer side below the knee ..... 15.
    Hind tibiæ with two stout setæ on outer side before the middle ..... 16.
15. Head and thorax yellow, middle and hind tibiæ with transverse comb-like rows of short black hairs ..... **multiseriata** sp. nov.
    Head and thorax black ..... **venusta** Coq.
16. Head black, thoracic dorsum and three apical segments of abdomen rufous. **olympiæ** sp. nov.
17. Front opaque, larger ..... **divaricata,** var. **perplexa,** var. nov.
    Front shining, smaller, 1.4-1.8 mm ..... **divaricata** Ald.

**Phora pachyneura** Loew. (Figs. 1 and 2.)

Loew, Centuries, vii, 97 (1866).

*Female.* Length 2.6–4.2 mm., of wing 3–4 mm. Moderately stout, black, the abdomen opaque, thorax and front subopaque, face shining. Head small, black; antennæ, and palpi of the same color; proboscis exserted, very stout and horny; front broad, short, rather convex, the setæ all turned upward. Scutellum with four marginal bristles. Feet piceous black, knees yellow, hind femora rather broad; middle tibiæ above near the base with two small setæ, front tibiæ with one very minute one, and hind tibiæ unarmed. Halteres black. Wings cinereous, the costa with very short cilia; heavy veins brownish black, the third very stout, furcate; the light veins brownish, toward the apex paler and thinner, the first bent near its base, the fourth subobsolete and greatly abbreviated.

The male differs in having the palpi larger, very shining and with very weak bristles. The antennæ are much larger than in the female and velvety black.

Alaska; Moscow, Idaho; March 17; Wisconsin (Wheeler); Olympia, Wash. (Kincaid); Seattle Wash. (Johnson); Montreal, Que. (Johnson).

This large and stout species can always be recognized by the extremely thickened third longitudinal vein, which is thicker than the costa at its center.

**Phora fratercula** sp. nov. (Fig. 3.)

*Male.* Length 2 mm. Head, thorax and abdomen black. Dorsum of thorax somewhat shining, sparsely covered with fine black hairs arranged in longitudinal rows. One pair of dorsocentral macrochætæ and two marginal scutellar bristles. Front short, one and three-fourths times as wide as long, with the usual bristles. Antennæ black, of rather large size, strongly black pubescent; arista pubescent and much thickened at the base. Palpi small, black, the usual lateral bristles present, well developed. Abdomen dull black, grayish pollinose. Hypopygium of rounded form, black and slightly pollinose. Legs long and rather slender, piceous; a little lighter on the anterior coxæ and at the knees. Anterior tibiæ with a delicate external bristle at basal third; middle legs with a pair and hind legs with a single bristle at the basal third, stronger than the ones on the anterior legs. Middle tibiæ with one and posterior tibiæ with two apical spurs. Halteres varying from light brownish to black. Wings very slightly infuscated, the costal vein with short, rather closely placed bristles; reaching to the middle of the wing. First vein ending midway between humeral vein and tip of costa; fourth vein arising at the furcation of the third, ending just before the wing tip, not recurved at the tip; fifth vein ending much behind wing tip; seventh vein wanting, so that there are only three light veins in the wing.

Described from two male specimens, collected by Dr. Wm. M. Wheeler, at Jackson's Lake, Wyoming, September 16, 1895.

This pretty species is related to the European *P. trinervis* Beck.,

but differs by the normal form of the palpi, which do not lack the lateral bristles. It also differs in having a shorter front and shorter first longitudinal vein. From *P. pachyneura* Lw. it is distinguished by its less thickened third vein, longer costal bristles, bristles on hind tibiæ, and presence of only two scutellar bristles.

**Phora thoracica** Meig. (Fig. 4.)

Meigen, Classification, i, 313.
Zetterstedt, Ins. Lapp., 795, 2.
Zetterstedt, Dipt. Scand., vii, 2852.
Schiner, Fauna Austriaca, ii, 342.
Becker, Monog. Phoridæ, 20.

Thorax and pleuræ reddish yellow, ferruginous or darker. Abdomen black. Halteres yellowish white. Dorsum with only one pair of dorsocentral macrochætæ and four distinct scutellar bristles. Head black, palpi yellow. Antennæ reddish yellow or ferruginous, rather small, arista almost bare; cheeks with two stout, downwardly directed macrochætæ. Second and sixth segments of abdomen elongated. Legs yellow, hind femora broadened; fore tibiæ with a single external bristle near the middle; middle ones with a pair at the base and a third one near the apex; hind tibiæ with two at the basal third, another at the apical third, and a fourth just before the apex; spurs of four posterior tibiæ well developed. Wings large, usually infuscated on the apical third; costal vein reaching beyond the middle of the wing, conspicuously thickened near the middle portion, and ciliate with very fine, short bristles. Third longitudinal vein distinctly bristly as far as the origin of the second; first vein equidistant from the humeral cross-vein and the apex of the costa; fourth vein arising somewhat before the fork of the third, strongly bent at the base, straight elsewhere; seventh vein distinct.

Length 3.5–5 mm., wing 4–5.5 mm.

There is a single specimen of this species, from New Hampshire, in the Osten Sacken Collection at the Museum of Comparative Zoology in Cambridge. I have seen no European specimens, but this one agrees perfectly with Becker's description, of which I have given a translation above. A second specimen is before me, from Franconia, N. H. (Mrs. Slosson).

**Phora microcephala** Lw.

Loew, Centuries, vii, 96.
Aldrich, Canadian Entomologist, xxiv.
Coquillet, *ibid.*, xxvii.

Almost wholly black, antennæ and palpi sometimes brownish; trochanters, knees, tarsi, and fore tibiæ yellowish. Front and thoracic dorsum shining; halteres yellow. Above the base of the fore coxæ are two bristles pointing downward; lower frontal bristles broadly divaricate. No lines or sutures about the ocelli. Wings almost hyaline; third vein extending to the middle or slightly beyond, distinctly forked; first longitudinal extending half-way to the tip of the

third, and the costa enlarged from there to the tip of the third vein. Fourth and fifth veins nearly straight at first, then broadly diverging, then coming together a little, ending equidistant from the apex of the wing; seventh vein indistinct. Middle tibiæ above near base with two setæ, the others with one very small one, which is sometimes imperceptible in the hind tibiæ. Dorsum of thorax with one pair of dorsocentral and four marginal scutellar bristles.

Length 2 mm., of wing 2.2 mm.

The specimens described by Loew were from the district of Columbia. I have seen only the type specimen which is in the Loew collection at Cambridge. The species can easily be recognized from the description.

The specimen referred to by Loew as "var. (?) *vena simplici*" is evidently abnormal, for in every other respect it resembles the type of *microcephala* exactly. It cannot be a species of *Hypocera*, although the simple vein would place it there. It lacks the stout legs and peculiar habitus of the members of that genus. This is the only case out of many hundred specimens which I have examined in which there is any such irregularity in the venation.

**Phora spinipes** Coq. (Figs. 5 and 6.)

Coquillett, Canadian Entomologist, xxvii. 105.

Black, subshining; the palpi, halteres, front and middle tibiæ with a large portion of their femora, also the knees of the hind legs, yellowish; all frontal setæ pointing upward. Front tibiæ each bearing three setæ on the outer side of the basal three-fourths; middle tibiæ each bearing three setæ in a curved row on the outer side of the basal half; hind tibiæ each with seven setæ in an irregular row extending nearly the entire length of the outer side. Wings hyaline, costal vein extending three-fourths the length of the wing, ciliate with rather short bristles; second heavy vein forked near its apex, tip of first heavy vein slightly beyond the middle between the humeral cross-vein and the apex of the second vein; fourth vein curved near its base, then nearly straight, the cell in front of it scarcely wider than the narrowest part of the cell behind it, seventh vein distinct.

Length 4 mm.

Hartford, Conn. The original type is a specimen taken by Mr. S. N. Dunning on April 30, 1893.

Besides the points noted in the original description, it may be noted that there is a single pair of dorsocentral macrochætæ and four marginal scutellar ones; the wing veins are light brown; the costal cilia extremely short and delicate, and the third vein is finely bristly.

Singularly enough this is the commonest species at Moscow, Idaho. I have from this place forty-six specimens, and Professor Aldrich

writes that he could have obtained any number. The length varies from 2.2–6 mm., of wing the same. On the fore leg I can see only two setæ in any case examined; on the hind leg they sometimes run as high as ten. The palpi being so much lighter than the antennæ is a noticeable character; the latter are black, the former yellow or brownish. Above the fore coxæ is a considerable group of setæ extending upward so as to coalesce with the infra-humeral group. Specimens from Idaho were taken in March, April and May. There is also a single female from Pullman, Wash., collected by Mr. C. V. Piper.

At first sight it would seem that this species is very close to the European *P. spinosissima* Strobl, to which it will go in Becker's table, but it differs decidedly in wing neuration and tibial cheatotaxy.

**Phora olympiæ** sp. nov. (Fig. 7.)

*Female.* Reddish yellow; the front, pleuræ, metanotum and first three abdominal segments black.

"Front broad, black, whitish pollinose and not shining, the lower edge in the projecting center red; lowest frontal bristles reclinate, moderately divergent. Antennæ red, with long, bare, slender, brown arista, which is yellowish at the base. Palpi with strong setæ, it and the proboscis yellow Close to the eye, below the antennæ on each side, a group of three setæ. Dorsum of thorax reddish chestnut, hardly at all shining, with one pair of dorsocentral and four marginal scutellar bristles; pleuræ black, indefinitely reddish along the sutures; halteres wholly yellow. The abdomen presents a very decided contrast in color, as indicated above; the venter is darker on the apical part than the dorsum. Legs, including coxæ, yellow; tips of tarsi scarcely darker; fore tibiæ with one, hind tibiæ with two serial setæ about the middle, intermediate tibiæ with two paired setæ near the base; hind femora moderately compressed. Wings large and long, venation exactly as in *P. spinipes* Coq." (J. M. A. MS.)

Length 5 mm, of wing 6 mm.

One female from Olympia, Washington, from Mr. Trevor Kincaid. This is a very distinct and readily recognized species.

**Phora scutellata** sp. nov. (Figs. 8 and 11.)

*Female.* Length 3.75 mm. Shining black. Head black, delicately punctured and very shining; front evenly convex, its bristles very stout but not unusually long, all reclinate. Ocelli placed on a slight tubercle. Antennæ fuscous, not prominent, palpi rufous, with moderately long bristles. Thorax above piceous black, subshining, covered with fine, brown, recumbent hairs. One pair of dorsocentral macrochætæ and four marginal scutellar bristles. Scutellum broadly margined with white behind, the margin extending forward in the middle so that the black basal part is distinctly bilobed. Abdomen broad, shining black, each segment narrowly margined with yellowish white; venter yellowish, hairy, as is also the tip of the abdomen. Legs yellowish, but much infuscated in places,

especially the posterior pair. Anterior tibiæ fringed externally with fine setulæ and with a single stout seta near the base on the outer side. Middle tibiæ with a pair of setæ at basal third on the posterior side and another lateral one just before the apex which bears a single spur. Hind tibiæ with five long setæ on outer side, a pair of them being placed just below the knee, then follow three more serially arranged; there is also a preapical seta and two spurs. Just before the apex, on the inner face, there is a series of about five comb-like transverse rows of setæ. Posterior femora very broad, shortly ciliated above and below. Wings subhyaline, very dilutely brownish; all of the veins very strong, black. Costa extending beyond the middle of the wing; first vein ending twice as far from the humeral vein as from tip of costa. Second vein ending close to third; costal bristles rather short and densely placed; fourth vein curved at base, straight at apex; fifth vein straight, ending closer to the wing tip than does the fourth; seventh distinct. Halteres pale yellow.

Described from a single female specimen collected on the island of Grenada, West Indies, by H. H. Smith (No. 172).

This large and handsome species could not be confounded with any other American species.

Aldrich

**Phora multiseriata** sp. nov. (Figs. 9 and 10.)

"Yellow, the greater part of the abdomen black, tibiæ and tarsi except the front ones blackish. Head, including occiput, wholly purely yellow. One large bristle at lower edge of eye, one descending bristle above the fore coxæ, and two ascending ones below the humerus. Metanotum blackish. Mesonotum with one pair of dorsocentral macrochætæ and only two marginal scutellar bristles. First segment of abdomen yellow, the sides a little darker; the following segments black, with a light yellow posterior margin; venter black. All the coxæ and femora yellow, hind femora greatly flattened and enlarged, the middle ones slightly so; hind tibiæ with an area extending the whole length of the upper side, where the usual minute hairs are replaced by larger ones, arranged in regular transverse rows; about sixteen series of these in the length of the tibia. The middle tibia has a smaller development of the same structure. Fore and hind tibiæ each with one seta below the knee, middle tibiæ with two and before the tip with a third placed at the end of the transverse rows, of which there are about eight. Wings with a yellowish tinge; costal vein scarcely reaching to the middle of the wing, first vein ending two-thirds the distance from the humeral vein to the tip of the third; fork of third vein slender, not diverging much from the main part, both together forming a curve, the convexity of which lies toward the apex and rear. Fourth vein straight, ending considerably before the apex of the wing. Costal vein with small cilia. Hypopygium of male rather small, yellow. Halteres yellow." (J. M. A. MS.)

Length 3.4–4 mm., of wing 3.1–3.5 mm.

Described from one male and five female specimens collected at Lawrence, Kans. I have also seen a specimen from Ithaca, N. Y., in Mr. C. W. Johnson's collection.

This is a rather robust species, especially in the female sex. The

comb like armature of the hind tibiæ is developed to a remarkable extent, much more so than in any other species of *Phoridæ* which I have examined.

**Phora venusta** Coq.

Coquillett, Canadian Entomologist, xxvii, p. 107 (1895).

♀. Head and thorax black, subshining; antennæ yellowish brown; palpi, halteres and legs, including the coxæ, yellow. Abdomen opaque velvet-black, the broad bases of the second and sixth segments and a triangular dorsal spot at the base of the third, fourth and fifth segments yellow; venter also yellow. Frontal setæ pointing upward. Front tibiæ on the outer side each bearing one, the middle tibiæ with two stout setæ near the base, hind tibiæ destitute of setæ on the outer side. Wings hyaline, costal vein extending to the middle of the wing, ciliate with minute bristles, the second heavy vein forked near the apex, the tip of the first vein near the last fourth of the distance between the humeral cross-vein and tip of the first branch of the second vein; first slender vein nearly straight, the cell in front of it subequal in width to the one behind it.

Length 1 mm.

Type locality, Boston, Mass. One specimen in the U. S. N. M. I have seen no specimens of this species.

**Phora comstocki** sp. nov. (Fig. 12.)

"*Male.* Antennæ and palpi red, halteres and legs yellow, hind tibiæ and tarsi a little darker; head, thorax and abdomen black. Front opaque. Dorsum of thorax somewhat shining, with two pairs of dorsocentral macrochætæ, of which the anterior pair is the smaller; scutellum with four stout marginal bristles. Pleuræ and middle coxæ brownish. Hind femora thickened; each hind tibia with three strong setæ before the middle and one at apex, besides two strong apical spurs. Middle tibiæ with two strong setæ below the knee and also a subapical one on the front side, besides the spur at apex. Front tibia with a moderately strong seta in the middle of the upper side. Hypopygium in the form of a rather large knob. Wings yellowish; costal vein extending beyond the middle of the wing; first vein reaching three-fifths of the distance from the humeral to the tip of the costal; third vein bare above, except for a single bristle near its base; fourth vein ending just before the apex of the wing, curved at base, straight at apex; fifth vein straight, parallel with the apical part of the fourth." (J. M. A. MS.)

Length 2 mm., of wing 2.5 mm.

One male, Ithaca, N. Y., July 13, 1894 (Cornell Univ.).

Named in honor of Professor J. H. Comstock.

This species differs from *luggeri* in not having hair on the upper side of the third vein, as well as by the number of dorsocentral macrochætæ. In this species the fourth vein in its first part is much less sinuous, there is a row of little bristles below at the tip of the hind femur, and the third seta of the hind and middle tibiæ is not so near the apex.

**Phora luggeri** Aldrich. (Fig. 13.)

Aldrich, Canadian Entomologist, xxiv, 145.

Head brownish black, front very broad, at the lower border with two small, widely divergent bristles arising a little below the lower edge of the front. Antennæ and palpi brownish yellow, the former with a yellow arista, the latter with stiff black bristles. Thorax brownish black, with few and small bristles: dorsum with a single pair of dorsocentral bristles and four marginal scutellar ones. Abdomen more or less yellowish at base above, the remainder brownish black. Wings hyaline, the heavy veins yellow; third vein hairy on the upper side to the point of furcation which is near the end, the two branches forming a very sharp angle; costal vein reaching considerably beyond the middle of the wing, its bristles short and fine; first vein ending a little nearer to the tip of costa than to the humeral cross-vein. Fourth vein strongly bowed at base, straight for the remaining two-thirds of its course, ending at the apex of the wing. Halteres wholly yellow. Legs entirely yellow, the front tibiæ with a bristle on the outer side below the knee, the middle and hind tibiæ each with a pair in the same position; middle ones with a subapical single bristle and one spur; hind ones with a pair of subapical bristles and a single spur.

Length 2.2-2.6 mm., of wing 2.5-3 mm.

The original types of this species were two females from St. Paul (Lugger).

Besides these, there are some twenty-four specimens in the collection from other parts of the country, as follows: twenty from Lawrence, Kans. (two being from the University of Kansas collection and the others from Aldrich); one from Delaware County, Pa. (Johnson); one from New Bedford, Mass. (Hough).

**Phora nitidifrons** sp. nov. (Fig. 14.)

Length 1.75-2.25 mm. Black, shining, front legs and antennæ brownish. Head black; front short, a little wider than high, very shining and quite smooth except for a few delicate lateral punctures in some females; bristles all present, of medium size. Palpi piceous, antennæ a little lighter, somewhat enlarged in the male; arista bare. Cheeks below with two stout macrochætæ. Dorsum of thorax shining, with one pair of dorsocentral macrochætæ and four scutellar bristles. Abdomen entirely black; a yellow spot sometimes present above at the base. Legs piceous black, front pair, knees and tarsi usually more brownish yellow. Front tibiæ with a single bristle at basal third; middle ones with a pair in the same position; hind femora stout; hind tibiæ grooved above, with three to five (usually four) small setæ arranged serially on the outer side. Tibial spurs weak, especially those of the middle legs. Projecting part of hypopygium rufous. Wings subhyaline, costa reaching about to the middle of the wing, its bristles closely placed but very short and delicate; tip of first vein twice as far from the humeral cross-vein as from tip of costa; fourth vein straight at base, recurved at apex; seventh vein distinct. Halteres pale.

This species resembles *P. cimbicis* Ald. very closely, but can always be separated from it by the smooth front and pale halteres.

Described from 23 specimens: 7 from New Bedford, Mass. (Hough); 9 from Ithaca, N. Y. (Comstock); 2 from Chester Co., Pa. (Johnson); 3 from Philadelphia, Pa. (Johnson); 1 from Delaware Co., Pa. (Johnson); 1 from Wood's Hole, Mass. (Brues).

**Phora cimbicis** Aldrich. (Fig. 15.)

Aldrich, Canadian Entomologist, xxiv, 143 (1892).

Head black, front broad, below with an obtuse prolongation in the middle; no ocellar prominence; at the extreme lower edge of the front, in the middle, are two bristles directed upward and strongly outward. Antennæ brownish black, palpi of the same color, longer than antennæ. Thorax black, pleuræ a little shining; a group of two or three bristles just below the prothoracic spiracle and a pair at the base of the fore coxæ. One pair of dorsocentral and four marginal scutellar bristles. Abdomen wholly satiny black like thoracic dorsum, except the first segment which is whitish above in the middle; the last segment longer than the preceding. Halteres black, the pedicel a little yellowish at base. Fore and hind tibiæ with one, middle tibiæ with two bristles on the outer side a little below the knee; the hind tibiæ have also a scattering row of three smaller ones running to the tip; the tips of the middle and hind tibiæ with long spurs. Legs wholly satiny brownish black, except that the front ones are from the coxæ gradually lighter, ending in brownish-yellow tarsi and that the middle tarsi and sometimes the middle tibiæ are also brownish yellow. Wings subhyaline; the third vein forked, fourth vein nearly straight, ending a little before the apex of the wing.

Length 3 mm., of wing 2 mm.

Three females, Brookings, South Dakota, reared from cocoons of *Cimbex americana* Leach. Emerged May 24, 26, 27. (Condensed and elaborated from the original description.)

There is also a single additional specimen from New Bedford, Mass. (Hough, No. 2841 ), and one from Toronto, Can.

This species closely resembles *P. nitidifrons*, but can always be readily recognized by its black halteres and by the fact that the front is foveately punctured, while in *nitidifrons* it is finely punctured on the sides and smooth medially.

**Phora incisuralis** Loew. (Fig. 16.)

Loew, Centuries, vii, 98 (1866).

Aldrich, Canadian Entomologist, xxiv.

Coquillett, *ibid.*, xxvii.

Front dark brown, antennæ red, palpi yellowish red, broad at tip, and with five black setæ; proboscis rather long, yellow. Thorax yellowish brown above and pure yellow on the sides, middle coxæ distinctly blackened, scutellum and metanotum brown, halteres yellow. Abdomen black above, first segment and posterior margins of the following ones yellow; venter yellow except on last segment. Legs yellow, including front and hind coxæ; tips of the broad hind femora slightly brownish. Fore tibiæ on the upper side with a series of four or

five fine setulæ, on the hind tibiæ a similar series slightly longer are present on the outer side; middle tibiæ with two setæ below the knee. Wings hyaline with a yellowish tinge, at the tip slightly infuscated; costal vein reaching a little beyond the middle of the wing; fork of third vein slender, first vein reaching at least three-fourths the distance from the humeral to the tip of the costal; fourth and fifth veins ending equally far from the apex of the wing, the former uniformly curved; seventh vein extremely delicate. Costa with small, fine cilia.

Length 3–3.6 mm., of wing 2.5 mm.

Besides the above, it may be noted that there is only a single pair of dorsocentral bristles and four equally strong marginal scutellar bristles.

One female specimen from Charles Harbor, Fla., collected by Mrs. Slosson and sent by Mr. Johnson; two specimens, Tifton, Ga., October 16 and 17 (Hough); one, Opelousas, La. (Hough). All females.

These are somewhat lighter in color than Loew's type, still one of these has a rather brown thorax. The only material disagreement is in the pleuræ "*nigromaculatæ*" in his description and the middle coxæ (pale yellow in his, very distinctly brown in some of mine). The type measured only 2.6 mm., but most of the species in this family are extremely variable in size.

This species, as well as *divaricata* and its variety *perplexa*, have on the upper side of the hind tibia a fine, close series of appressed, short hairs, forming a black line the length of the tibia, but this is separate from what Loew alludes to as "*in latero externo.*"

**Phora divaricata** Aldrich.

Aldrich, Trans. London Ent. Soc., 1896, pt. 3, p. 437.

Antennæ, palpi, pleuræ, halteres and legs deep yellow; front dark brown or black, the lower edge yellowish; thorax above varying from yellow to brown. Abdomen black or brown, the posterior margin of each segment with a narrow band of light yellow, which continues more or less as a stripe down the middle of the dorsum; venter yellow. Dorsum of thorax with one pair of dorsocentral macrochætæ and only two strong marginal scutellar bristles. The other pair is present, but very small and scarcely noticeable. Anterior tibiæ on the upper side with a row of four setæ; middle tibiæ with two setæ below the knee, hind tibiæ with a minute row of fine hairs along the upper edge, but no setæ except at apex. Hind femora considerably thickened. Wings tinged with yellow; costal vein reaching a little past the middle of the wing; first vein reaching three-fourths of the way from humeral to tip of costal; the fork of the third vein but little visible, close to the main part; male hypopygium very large and conspicuous, bent under.

Length 1.4–1.8 mm., of wing 1.5–2.4 mm.

Before me are the types, two males and five females from St. Vin-

cent, West Indies, also six males and one female from Grenada, W. I. All were collected by H. H. Smith and sent by Dr. Williston, who received them from the Entomological Society of London.

The relationship of this species to *incisuralis* Lw. is such that the variety *perplexa* forms a connecting link between them. Typical *divaricata* is more yellow and smaller than *perplexa* and has a more tropical range.

**P. divaricata** Ald., var. **perplexa,** var. nov.
Coquillett (*P. incisuralis*), Canadian Entomologist, xxvii, 104.

Precisely like the foregoing, but differing by its larger size and more northern range. It is very closely related to both *incisuralis* Lw. and *divaricata* Ald., but can be readily distinguished from the former by the absence of the four or five small setæ on the hind tibiæ, which characterize *incisuralis*. It also agrees more closely with *divaricata* on account of the extremely small size of the lateral scutellar bristles, which are large and stout in *incisuralis*. It would seem to be an incipient species. This is evidently the form tabulated by Coquillet (*loc. cit.*) as typical *incisuralis*.

Three specimens: one from Tick Island, Fla. (Johnson), May 3, 1894, and two from Tifton, Ga., October 16 and 17, 1896 (Hough).

**Phora groenlandica** Lundbeck. (Fig. 17.)
Saertryk af Vidensk. Medd. fra den naturh. Foren. i Kjbh. (1900.)

Black, slightly cinerascent, thorax somewhat shining, abdomen opaque. Head, antennæ and palpi, black. Wings hyaline, slightly yellowish, costa provided with rather long bristles, nervures dark; third longitudinal vein furcate, the four longitudinal nervures more slender than the first and third veins. Halteres black, legs piceous, everywhere covered with short hairs; posterior tibiæ with rather long spurs. Male and female, length 2-2.3 mm.

Related to *Phora ciliata*, but readily distinguished by the black palpi, longer costal bristles and different wing venation.

*Male.* Black, slightly cinerascent, thorax somewhat shining, densely covered with short, delicate, brown pile; with long macrochætæ along the margin. Abdomen opaque. Head equal to thorax in width, front wide, black, provided with long reflexed macrochætæ and with a median impressed line. Palpi black, sometimes brownish; antennæ black. Wings hyaline, slightly yellowish, costa provided with rather long bristles, nervures dark brown, first longitudinal vein ending before the third, third furcate at the apex. Four delicate longitudinal nervures are present, the first of which is rather curved at the base and straight apically, ending before the apex of the wing, second and third of these four nervures slightly sinuate, especially the third, fourth almost straight. Near the front margin of the wing, extending from the third longitudinal vein, is an obsolete fold which simulates a nervure. Halteres black; legs piceous varying to

brown, anterior ones lighter, all delicately pilose, tibiæ, especially on the exterior margin, densely short ciliate, posterior tibial spur long.

*Female.* Resembles the male, but the abdomen is shorter and stouter.

Habitat, Greenland, west coast, as far north as Lat. 69°.

I have not seen this species, but have inserted it in the table from the description, which unfortunately omits the important details of the chætotaxy of the thorax and legs.

### DORNIPHORA Dahl.

Dahl, SB. d. naturf. Freunde. 1898, No. 10, p. 188.
Becker, Monog. Phoridæ, p. 84. (1901.)

Front with three transverse rows of four bristles each and two anterior reclinate bristles. Ocelli present, third joint of antennæ with a dorsal arista, third vein forked, mediastinal vein obsolete, costa very finely ciliated. Legs bristly, pulvilli and empodium wanting or much reduced. Front tibiæ with a row of four bristles on the anterior side; middle tibiæ with a pair of bristles near the base and a third just before the apex, besides the tibial spurs. Hind tibiæ somewhat widened, ciliated with fine bristles. Proboscis of the female thin and greatly elongated, normal in the male.

Represented by a single species from the Bismarck Archipelago, *D. dohrni* Dahl.

The close resemblance which this species shows to the American *P. incisuralis* Lw. and *P. divaricata* and the chætotaxy of the front legs is very striking, the present genus being separable from these two *Phoras* only by the weakened mediastinal vein, differently shaped anal angle of the wing and long proboscis of the female. I doubt, therefore, if it really represents a valid genus. Dahl has mentioned the relation between *Dorniphora* and *Phora incisuralis*, and suggested that possibly the latter has an elongated proboscis in the female. The proboscis in this sex is, however, perfectly normal.

### HYPOCERA Lioy.

Lioy, Atti. Inst. Venet., 1864, 78.
Lioy (*Gymnoptera*), l. c., 79.
Becker, 1901, Monog. Phoridæ (Phora).

Anterior frontal bristles reclinate; frontal bristles twelve or fourteen in number, arranged as in *Phora*. When there are only twelve, either the two anterior ones or the middle two of the next row above may be wanting. Third longitudinal vein simple, not furcate, often separated or imperfectly fused with the costal vein at the tip. Antennæ variable, usually ovate or oval, with a dorsal arista, but sometimes they are elongated and drawn out into a point, and bear a sub-apical arista. Front sometimes with an ocellar tubercle or with a median groove. Costal vein ciliated with bristles; mediastinal vein distinct, seventh

vein present; anal angle of the wing with a series of bristles. Ovipositor of female retractile, not heavily chitinized or spear-shaped. Legs usually with bristles on the outer side of all the tibiæ before the apex, generally one on the fore tibia, two on the middle, and one, two or none on the hind tibia. Pulvilli and empodia distinct.

All the species which I have included in the present genus are considered by Becker as belonging to *Phora*, but all are very distinct by the characters enumerated above. The species also differ in habitus, being of more robust form and with stouter hind legs.

I have adopted the name *Hypocera*, although when described by Lioy it was improperly characterized. His various types, however, seem all to belong here, so I have modified the diagnosis as shown above.

## TABLE OF NORTH AMERICAN SPECIES.

1. Antennæ with the third joint oval as usual, last joint of front tarsi not enlarged.....2.
   Third antennal joint long and pointed, last joint of front tarsi flattened and enlarged, vertex semicircularly elevated in the male.
   1. **johnsoni** sp. nov.
2. Fourth vein evenly curved throughout, gradually and evenly divergent from the fifth, small species.....6. **grenadensis** sp. nov.
   Fourth vein more strongly flexed at the base than at the apex, halteres black.....3.
3. Hind tibiæ with a bristle on onter side just before the middle.....4.
   Hind tibiæ without a bristle externally, but on whole outer side covered with transverse rows of flat black hairs.....2. **ehrmanni** sp. nov.
4. Antennæ, palpi and proboscis black, third longitudinal vein finely hairy for its entire length.....3. **femorata** Meig.
   Palpi and proboscis yellow.....5.
5. Wings hyaline, the third vein clavate at its tip, antennæ reddish yellow.
   4. **clavata** Lw.
   Wings strongly infuscated, third vein scarcely enlarged at apex, antennæ reddish brown or piceous.....5. **mordellaria** Fall.

**Hypocera johnsoni** sp. nov. (Plate vi, figs. 18, 19.)

*Male.* Black, except antennæ and palpi, which are orange yellow, and front legs, which are brownish. Head black, front shining, evenly and rather sparsely coarsely punctate throughout. Two anterior frontal bristles stout, reclinate, next row above consisting only of the two lateral bristles, the median ones being absent; next row of four bristles arranged in a straight line; vertex as in the male of *coronata* Becker,—*i. e.*, semicircularly elevated and very sharp above; ocellar tubercle present, although not elevated so far as in *coronata*. Antennæ long, oval and acuminate toward the tips, equal in length to the eye height and arcuate, bright orange yellow, glistening in certain lights. Arista apical or very nearly so, no longer than the third joint, whitish pubescent. Palpi small, flattened, strongly setose. Cheeks with a single bristle; infraocular cilia long, but

shorter than in *ehrmanni*. Dorsum scarcely shining, with one pair of dorsocentral, two large and two smaller scutellar macrochætæ. Halteres black, white pollinose. Anterior legs black at base and varying through brown to luteous on the tarsi, the last joint of which is enlarged and flattened as in the European *coronata*; the tibiæ with a single external bristle just before the middle. Middle and hind legs with the trochanters and knees yellowish; middle tibiæ with a pair of setæ just before the middle and a third just before apex on outer side, as well as a single long apical spur. Hind tibiæ with two grooves above, inclosing a longitudinal carina; with one bristle just before the middle and another just before the apex which bears two long and several short spines; there are also about three comb-like rows on the *inner* side at apex. Abdomen shining, second segment very much elongated; hypopygium large, ventral, shining. Wings hyaline, yellowish between the thick basal nervures, which are ferruginous. Cilia of costa dense, but not long; first vein meeting the costa a little more than half way from the humeral vein to tip of third longitudinal; the latter straight, with a small knob at apex; costal vein reaching to about the middle of the wing; fourth vein curved at the base, straight elsewhere; fifth vein straight throughout; seventh not very distinct; apex of wing much nearer to tip of fourth vein than fifth; fourth vein far away from third at its point of origin.

Length 5 mm.

Described from a single male specimen, collected at Riverton, N. J., August 31, by Mr. C. W. Johnson, after whom I take great pleasure in naming this interesting species.

The present species is evidently closely related to *coronata* Becker, of Europe (Becker, Monog. Phor., 41), but differs very clearly in the frontal cheatotaxy, form and color of antennæ and palpi, and wing venation.

The antennæ of this species recall strikingly those of *Conicera*, yet the insect does not have the habitus or other characters of that genus. It would seem that the form of the antennæ alone cannot be a very valuable character for the definition of genera.

This may possibly prove to be the male of *ehrmanni*, but the differences between the two are so much greater than those between the sexes of the closely related *coronata* that I have no doubt they will prove to be quite different species. Unfortunately it is impossible to be absolutely sure.

**Hypocera ehrmanni** sp. nov. (Plate vi, fig. 20.)

"*Female.* A large and robust species; everywhere shining black except the antennæ and palpi, which are deep yellow, the former reddish, with a long black arista on the oval third joint. Trochanters also somewhat red and the knobs of the halteres more brown than black, the stems yellowish. Front very polished, punctured and hairy on the sides, smooth in the middle. Anterior pair of frontal bristles present, approximate and reclinate; next row above arcuate, the row above less so and placed high up. No ocellar tubercle, but the vertex is sharp,

somewhat as in the female of *coronata* Becker. Postocular cilia very long and stout below, cheeks each with one long bristle. Thorax subshining, with one pair of dorsocentral macrochætæ and four marginal scutellar bristles. Abdomen with considerable hair on the sides, second segment longest. Front tibia with a single strong seta before the middle; anterior tarsi with the last joint not flattened or enlarged; intermediate tibia with two setæ at the basal third, also two long and several short apical spines; hind femora much flattened, their tibiæ with no setæ, but the small appressed hairs are arranged in about twenty-five comb-like transverse rows along the entire length of the hind side, much as in *P. multiseriata*, with two long and several short apical spines. Wings brownish, especially toward the tips, costal vein reaching nearly to the middle of the wing, densely ciliate with rather long hairs; first vein terminating nearly two-thirds the distance from the humeral vein to the tip of costal; fourth vein gently curved at base and slightly recurved at apex; seventh vein distinct." (J. M. A. MS.)

One female, Pittsburg, Pa., from Mr. G. A. Ehrmann, to whose enthusiasm and kindness I owe a number of interesting species of Diptera.

**Hypocera femorata** Meig. (Plate vi, fig. 21.)

Meigen, Syst. Beschr., vi, 213, 5 (1830).
Zetterstedt, Dipt. Scand., vii, 2886, 34.
Schiner, Fauna Austriaca, ii, p. 339.
Becker, Monog. Phor., p. 41 (1901).

*Male.* Length 2.5–3 mm. Thorax, abdomen and halteres black. Dorsum of thorax rather shining and bearing only one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Front wide, strongly convex and shining; the middle row of bristles forming a straight line very near to the vertex, so that the distance between it and the lower row is greater than usual; the lower row is arcuate and the two middle bristles above the antennæ are lacking. Antennæ, palpi and proboscis black; third antennal joint small with a bare arista; a long macrochæta placed at the corner of the eye. Abdomen opaque, the second segment elongated and with long hairs on the sides, sixth segment not elongated. Hypopygium small, usually only two lamellæ, and no basal cylindrical part visible. Legs piceous, coxæ at tip and knees only a little paler. Fore tibiæ and tarsi reddish-brown, the former with a bristle at the basal third; middle tibiæ with a pair of bristles at the same place and also a bristle on the outer side just before the apex, as well as a long apical spur. Hind tibiæ grooved and thickened, with a bristle on the outer side at the basal third, a second just before the apex, and three to four apical spurs. Wings weakly tinged with yellowish brown, the costal vein reaching to the middle of the wing, not thickened and provided with short bristles; third vein not forked, but usually enlarged and slightly lamellate at apex, finely hairy for its entire length. First and third longitudinal veins widely separated, so that the first segment of the costal vein is only one and one-fourth times as long as the second. Fourth vein very strongly arcuate at its base, straight at apex, approaching near to the fifth at base.

The female differs in having the lamelliform enlargement of the third vein more distinct.

I have three females which I cannot distinguish in any way from the description of European specimens. One was collected by Mr. C. Abbott Davis at Providence, R. I., May 30, and was sent me by Mr. C. W. Johnson; another is from Mt. Washington, N. H. (Mrs. Slosson); and a third from New Bedford, Mass. (Hough).

**Hypocera clavata** Lw. (Plate vi, figs. 22, 23.)

Loew, Centuries, vii, 95.

Aldrich, Canad. Ent., xxiv.

*Male and female.* Very black, moderately shining, all the frontal setæ directed upward. Antennæ red, palpi luteous. Wings hyaline, costa with very short cilia, second vein simple, middle tibiæ with two setæ above, others with one. Length 2.6–3 mm., of wing the same.

Stout, very black, moderately shining; front broad, rather convex, punctured, all bristles directed upward. Antennæ reddish, with ochraceous tinge; palpi rather broad, luteous; apex of the abdomen, especially in the male, more shining than the rest of the body. Front legs dull testaceous, varied with fuscous; hind legs black or piceous black, knees testaceous; hind femora very black; middle tibiæ above near base with two setæ, the others with one. Halteres black. Wings hyaline, costa black, very finely ciliate. Of the strong veins the second is simple, the apex dilated; of the slender veins the first is extremely flexed near the base.

District of Columbia (Osten Sacken).

This species is allied to *Phora femorata*, but is easily to be distinguished by the color of the antennæ and palpi.

Besides the original type there is in the Museum of Comparative Zoology at Cambridge a specimen from New Hampshire. In the collection before me are two specimens, both collected by Mr. C. W. Johnson, one from Boston, the other from Montgomery County, Pa., July 4, 1892; and a headless ♀ apparently of this species from Douglas County, Kans.

Besides its lighter color, this species differs from *femorata* by the sharper curvature of the fourth vein in the wing.

**Hypocera mordellaria** Fallen.

Fallen, Dipt. Suec. Phytomyzides, 6, 4 (1823).

Meigen, Syst. Beschr., vi, 212, 2.

Zetterstedt, Dipt. Scand., vii, 2883, 31.

Schiner, Fauna Austr., ii, p. 339.

Coquillett, Canad. Ent., xxvii, p. 104.

*Male.* Length 3–3.5 mm. Thorax, abdomen and halteres black, dorsum of thorax with one pair of dorsocentral macrochætæ and two marginal scutellar bristles, front shining, with the usual bristles, the middle row of which forms a straight line while the lower row is arcuate. Antennæ varying from reddish brown to piceous, the third joint rather large, with a finely pubescent arista.

Palpi and proboscis reddish yellow, a strong bristle at the lower corner of the eye. Abdomen opaque, the first segment margined with yellow, second segment elongated, its lateral angles with long black hairs; sixth segment not elongated, but usually with a yellow border which is also sometimes visible on the other segments. Hypopygium of moderate size, with long hairs and a distinctly protruding, yellow-black, hairy, sheath-like appendage. Legs piceous, the trochanters and knees, front tibiæ and their tarsi reddish yellow; femora thickened. Fore tibia with a bristle at the basal third; middle ones with a pair at the base and a second outer bristle at the apical third, as well as a long apical spur. Hind tibiæ clavately thickened, but without a groove, with short recumbent ciliation on the posterior face; with an external bristle at the basal third, and another just before the apex, which bears two spurs. Wings strongly tinged with fuliginous brown; costal vein attaining the middle of the wing, rather stout, especially at the base, and piceous; the other veins yellowish brown. Ciliation of costal vein long and sparse, third vein not forked, finely bristly on its basal third; first segment of costal vein not much longer than the second; fourth vein sharply arcuate at base and straight at apex.

The female has a somewhat smaller third antennal joint and the arista is a little more strongly pubescent.

This species was recorded from North America by Coquillett. I have seen no specimens from this country.

**Hypocera grenadensis** sp. nov. (Plate vi, fig. 24.)

*Female.* Head black, front shining, two anterior frontal bristles small, reclinate, next row large, arranged in a straight line, as are also the two upper rows. No ocellar tubercle present, but the front bears a deeply impressed median longitudinal line. Antennæ somewhat obtusely pointed, dull ferruginous, darker where the subapical feathered black arista is inserted. Palpi small, bristly, reddish brown. Dorsum rather shining, black, except for slightly yellowish anterior margin and humeral angles. One pair of dorsocentral macrochætæ and two distinct marginal scutellar bristles, besides two very small lateral ones. Halteres reddish yellow. Abdomen yellowish brown except for small subtriangular spots laterally on each segment; apical segment black. Ovipositor long, exserted, but not more heavily chitinized than usual. Legs honey yellow; anterior tibiæ with a bristle on the outer side at basal and apical third; middle tibiæ with a pair of stout bristles on outer side at basal third and another smaller subapical one, besides a very long spur at apex. Posterior tibiæ with a single external bristle at basal third, another subapical one and two apical spurs. Hind tarsi very long, the first joint bristly below. Wings hyaline, the costal vein black, other nervures piceous; costal vein reaching to the middle of the wing, velvety black and considerably thickened throughout; third vein gradually thickened toward tip, not clavate, and free from costa at tip; seventh vein distinct.

Length 1.8 mm., wing 1.7 mm.

Described from a single female specimen collected by H. H. Smith on the Island of Grenada, West Indies, (No. 57.)

This is the smallest species of the genus which I have seen. It is very distinct and not closely related to any described species.

## TABLE OF SPECIES.

1. Dorsum of thorax yellow or reddish yellow.....2.
   Dorsum of thorax dark brown or black.....15.
2. Front twice as high as broad, with no median bristles in the two rows next above the proclinate ones, which are small and all of equal size, insect wholly yellow, with black spots on the abdomen....**epeirae** Brues.
   Front of the usual form, and not lacking any of the median bristles.....3.
3. Scutellum with four equally strong marginal bristles.....4.
   Scutellum with only two distinct bristles.....8.
4. Wings more or less yellowish, the veins yellowish brown.....5.
   Wings hyaline, the veins blackish, costal vein not quite reaching to the middle of the wing.....**nigriceps** Lw. var.
5. Head, antennæ and front, except ocellar tubercle, yellow.....6.
   Head, antennæ and front black, second segment of abdomen without, or with scarcely evident lateral hairs, palpi longer and broader than usual.
   **nigriceps** Lw.
6. Costal vein reaching to or slightly beyond the middle of the wing.
   **picta** Lehm.
   Costal vein reaching far beyond the middle of the wing, fourth vein evenly curved.....7.
7. Abdomen in great part bright orange yellow, costal vein unusually long, its cilia moderate.....**aurea** Aldrich.
   Abdomen almost entirely black, segments each with very narrow pale border and more or less yellowish median portions, costal vein not so long, its cilia rather short.....**scalaris** Lw.
8. Costal vein reaching to the middle of the wing or beyond.....11.
   Costal vein short, not reaching to the middle of the wing.....9.
9. Proclinate bristles small or wanting, hind tarsi black, the hind metatarsus of the female thickened.....**fasciata** Fall.
   Proclinate bristles well developed, hind tarsi yellow, the hind metatarsus not thickened in the female.....10.
10. Halteres brown or black.....**fungicola** Coq.
    Halteres yellow.....**fungicola** Coq. var.
11. Costal vein with very short cilia, tip of first vein as near to humeral vein as to the tip of the third vein.....**flava** Fall.
    Cilia of costa not quite so short, segments of abdomen each with lateral black triangular spots which sometimes fuse into bands.
    **flava** Fall. var. (?)
    Costal vein with rather long cilia.....12.
12. Frontal cheatotaxy as usual, lower edge of front with four proclinate median and two reclinate lateral bristles on each side.....13.
    Lower edge of front with four proclinate median bristles and only one reclinate one on each side.....**atlantica** sp. nov.
13. Fifth and sixth veins convergent for basal half, then strongly divergent, seventh vein very close to the wing margin, wings brown..**obscura.**
    Fifth and sixth veins gradually divergent for their whole length, wings hyaline.....14
14. Tip of first vein one and one-half times as far from the humeral vein as from the tip of the third vein.....**lutea** Meig.

15. Scutellum with four equally strong bristles.....16.
Scutellum with only two bristles.....18.
16. Palpi of male enlarged and without the usual bristles, fifth vein sinuate at the middle and then parallel with the fourth..**magnipalpis** Ald.
Not such species.....17.
17. Tip of first vein twice as far from the humeral cross-vein as from the tip of the third.....**giraudii** Egg.
Tip of first vein one and one-half times as far from the humeral cross-vein as from the tip of the third.....**halictorum** M. et B.
18. Abdomen of male with long, erect, blunt hairs, especially thickly placed near the tip, costal vein reaching about to the middle of the wing, with very long cilia, black, except palpi and legs....**rufipes** Meig.
Abdomen destitute of such hairs, bare, or nearly so.....19.
19. Proboscis of female normal.....21.
Proboscis of female exserted and enlarged.....20.
20. Proboscis much swollen and enlarged, very fleshy, palpi black, shining black species with light yellow legs.....**rostrata** M. et B.
Proboscis projecting, stout and horny, third antennal joint of male enlarged. **cata** M. et B.
21. Posterior tibiæ strongly ciliated above with bristles.....23.
Posterior tibiæ not, or very obsoletely ciliated above.....22.
22. Costal vein extremely short, reaching only one-third of the length of the wing; first, second and third veins ending very close together. **pygmæa** Zett.
Costal vein longer, distinctly more than one-third the length of the wing..24.
23. Wings infuscated.....**minuta** Ald.
Wings hyaline.....**furtiva** Ald.
24. Costal vein with long cilia.....25.
Costal vein with short, thickly placed cilia, reaching to the middle of the wing.....**nigriceps** Lw.
25. Costal vein reaching to the middle of the wing, legs yellowish or piceous. **pulicaria** Fall.
Costal vein not reaching to the middle of the wing.....26.
26. Tip of first vein midway between humeral cross-vein and tip of third. **setacea** Ald.
Tip of first vein much nearer to tip of third vein than to the humeral cross-vein.....27.
27. Thorax shining, four distinct proclinate bristles.....**agarici** Lint.
Thorax dull, only two distinct proclinate bristles, the other pair very small. **albidohalteris** Felt.

**Aphiochæta epeiræ** Brues. (Plate iv, fig. 25.)

1902. Brues, Psyche, p. 351. Fig.

*Female.* Length 3–3.5 mm. Rather broad and stout, almost wholly yellow. Abdomen quadrimaculate with black. Front shining, delicately punctulate and with a few black hairs; twice as high as broad; with a lateral row of four bristles, the vertex with four bristles arranged at the corners of a square between the lateral rows; four anterior proclinate bristles also present. Ocellar tubercle absent, no median furrow on the front. Antennæ luteous, except the third seg-

ment of the arista, which is black. Palpi yellow. Post-ocular cilia stout, black, the lowest three or four, which are below the eye, being stout and twice as long as the others. Thorax yellow, paler below and brownish above except for a rather wide dorsal vitta. Dorsum subshining, with a single pair of dorsocentral macrochætæ and two marginal scutellar bristles. Abdomen yellow, first two segments each with a large, quadrate, very sharply defined, lateral spot (sometimes absent on the third segment). The spots on the second segment each bear a tuft of small black bristles at the middle. Ovipositor black at extreme base. Legs yellow, each coxa with a few stout bristles at the apex, together forming a stiff backwardly directed brush. Femora wholly pale, the posterior ones deeper yellow. Tibiæ, especially the posterior pair, spinulose above; four posterior tibiæ each with a single apical spur, that of the middle leg very long, half as long as the tibia. The posterior tibiæ have a fine black line above, and their tarsi are bilineate with black externally. Wings yellowish, faintly dusky at the tips, veins fuscous; costal vein thickened medially, reaching to the middle of the wing, its cilia of medium length; third vein furcate; tip of first vein midway between the humeral vein and tip of third vein. Four equally distinct lighter veins present,

Besides the original types from Texas, I have a specimen from Opelousas, La. (Hough); one from Florida; two from Delaware Water Gap (Johnson); and one from North Mt., Pa. (Johnson).

This is a very distinct species by the form of the front and frontal cheatotaxy. The abdominal coloration is also very characteristic, and seems to be quite constant. The species has been bred from the egg cocoons of the spider *Epeira*.

**Aphiochæta pygmæa** Zett. (Plate iv, fig. 26.)

Zetterstedt, Dipt. Scand., vii, 2860.
Egger, Verhd d. k.k. zool.-bot. Ges., 1236 (1862) (*brachyneura*).
Schiner, Fauna Austriaca, ii, 344 (*brachyneura*).
Strobl, Phoriden Oesterreichs, 196, 11 (*brachyneura*).
Becker, Monog. Phoridæ, p. 49.

*Male.* Thorax and abdomen black, brown, reddish or yellow. Dorsum of thorax with short, fine, black hairs and two scutellar bristles. Halteres yellow. Head yellow or dark brown; the front opaque, gray pollinose. Antennæ varying from yellow to brown, the third joint of only medium size, with an almost bare arista. Palpi pale, with the usual bristles. In the lighter specimens the abdomen is considerably darkened above or has wide blackish bands anteriorly on the segments. Legs yellow, varying to blackish brown, the tips of the hind femora blackened. Hind tibiæ lined with black and very finely ciliate. Wings and veins weakly yellowish brown. Costal vein with rather long cilia, reaching to only one-third the length of the wing; the first vein ending very close to the second, so that the first segment of the costal vein is three or four times as long as the second.

There are three specimens from Moscow, Idaho (Aldrich); one from Palo Alto, Cal. (Stanford University); and a number from

Austin, Texas (Melander), which undoubtedly belong to this species. They differ as follows from the above description of European specimens as given by Becker: the body is uniformly darker, almost black, the halteres blackish, wing veins darker, hind femora unicolorous, dark brown in Idaho specimens. Otherwise they seem to be identical with the European form.

**Aphiochæta fasciata** Fallen.

Fallen, Dipt. Suec. Phytomyzides, 7, 9.
Zetterstedt, Dipt. Scand., vii, 2879, 28.
Schiner, Fauna Austriaca, ii, 344.
Slosson, Entomological News, vi, 7.
Aldrich, Diptera of St. Vinc., Trans. Lond. Ent. Soc., 1896.
Becker, Monog. Phoridæ, p. 50.

Length 1.75–2 mm. Wholly yellow; second to fourth abdominal segments black above. Two scutellar and one pair of dorsocentral bristles present. Head yellow; front above varying from gray to fuscous; strongly convex and long, so that the antennæ are inserted very low down; second joint large, ovate, with a short bare arista. Lower row of frontal macrochætæ arranged in an arcuate row, widely separated from the second row; the middle pair of anteriorly directed bristles absent or scarcely developed. Abdomen and halteres dull yellow; abdomen more or less infuscated, but the fifth segment usually bright yellow. Hind tibiæ not darkened at the apex, lined with black and with two evident rows of fine bristles; hind tarsi black. Wings rather small, almost hyaline; the costal vein short and weakly bristly, not reaching to the middle of the wing. First and second longitudinal veins closely approximated.

I have not seen any specimens from this side of the Atlantic. It has been reported from New Hampshire by Mrs. Slosson, and from St. Vincent by Professor Aldrich.

It should be easily recognized by the short costal vein, which falls considerably short of the middle of the wing. This is also the case in *pygmæa* Zett., but in this latter species it is still shorter and is only one-third the length of the wing.

**Aphiochæta obscura** sp. nov. (Plate vi, fig. 27.)

Length 1 mm. Head brown, thorax and legs yellowish, abdomen black, wings brown. Front fuscous, sparsely pale hairy, cheatotaxy as usual. Ocellar tubercle and median impressed line very prominent. Antennæ small, yellowish brown, with a pubescent arista. Palpi yellow, with strong bristles; post-ocular cilia much enlarged below; two strong cheek bristles. Thoracic dorsum luteous, rather shining; with one pair of dorsocentral macrochætæ and only two marginal scutellar bristles. Halteres pale brown. Abdomen black, the posterior edges of the segments brownish, last segment yellow. Legs luteous, darker toward the tarsi; middle and hind tibiæ each with a single apical spur; the hind ones very obsoletely ciliated. Wings infuscated; brownish yellow; veins piceous; costa reaching to the middle of the wing, its bristles sparse and delicate, although not

so very short; first vein ending midway between the humeral cross-vein and the tip of the costa; fourth vein evenly curved, fifth and sixth convergent to the middle, then sharply divergent; seventh vein very close to the anal margin of the wing.

Described from a single female specimen from St. Vincent, West Indies (No. 17).

This species is most easily recognized by its brown wings and the configuration of the light veins.

**Aphiochæta picta** Lehman. (Plate vii, fig. 28.)

Lehmann, Hamb. Observ., 1822, p. 43.
Zetterstedt, Ins. Lapp., 797, 12 (*interrupta*).
Macquart, S. à Buffon., ii, 628, 17 (*interrupta*).
Schiner, Fauna Austriaca, ii, 337 (*interrupta*).
Coquillett, Canad. Entomol., xxvii, 104 (*interrupta*).
Becker, Monogr. Phoridæ, p. 52.

*Male.* Length 2.5 mm. Wholly yellow; thoracic dorsum somewhat shining, with four distinct scutellar macrochætæ and one pair of dorsocentrals. Head usually entirely yellow, including the front and greater part of the cheeks, although the former is sometimes gray pollinose; frontal bristles all present and in the usual positions; second antennal joint rather large, with a somewhat pubescent arista; cheeks with a row of bristles in addition to the usual two stout macrochætæ; palpi feebly or not at all bristly. Pleuræ below the roots of the wing and posterior face of middle coxæ with small black dots. Halteres and legs yellow, the tips of posterior femora infuscated. Hind tibiæ lined with black and distinctly ciliated, under side of hind femora with black bristly hairs. Wings tinged with yellowish brown; the costal vein with short bristles, reaching to the middle of the wing; veins yellowish brown.

The female differs by the normally bristly palpi, the smaller third antennal joint, the presence of only very short bristly hairs on the hind femora.

This common European species is represented in the collection by specimens from Wisconsin (Wheeler). It has previously been recorded from North America,—New Jersey (Smith's List); White Mountains, N. H. (Slosson); St. Vincent, W. I. (Aldrich).

**Aphiochæta flava** Fallen. (Plate vi, fig. 29.)

Trineura flava. Fallen, Dipt. Scand. Phytomyzides, 7, 8.
Phora flava. Zetterstedt, Ins. Lapp., 797, 10.
Phora flava. Zetterstedt, Dipt. Scand., vii, 2876.
Phora flava. Schiner, Fauna Austriaca, ii, 343.
Phora flava. Becker, Monog. Phoridæ, p. 54.

Length 1.5–2 mm. Thorax, abdomen and halteres reddish yellow. Dorsum of thorax opaque, covered with short black pile; only two scutellar and one pair of dorsocentral macrochætæ present. Head grayish yellow, front grayish pollinose. Antennæ and palpi varying from reddish to bright yellow, of the usual

size; arista long, pubescent; cheeks just below the eye with two stout downwardly directed macrochætæ. Abdomen opaque, sometimes brownish or blackish above, but without distinct markings. Legs yellow, the tips of the posterior femora infuscated; posterior tibiæ lined above with black and delicately spinulose. Wings grayish brown; costal vein reaching to the middle of the wing, its bristles very short; first longitudinal vein very short, so that the first segment of the costa is no longer than the second; fourth vein, which arises at the bifurcation of the third, somewhat arcuate and terminating before the apex of the wing.

This common and variable European species is represented in the collection by numerous specimens from Wisconsin (Wheeler) and New Jersey (Johnson). Many of the specimens vary much in color from the type form, but all seem to belong to a single species. Some have the costal bristles a trifle longer, and spotted or banded abdomens, otherwise they are exactly similar.

**Aphiochæta atlantica** sp. nov. (Plate vii, fig. 30.)

Length 1.75–2.5 mm. Yellow, except tips of hind femora and anterior lateral corners of abdominal segments. Head honey yellow, front thickly covered with fine black hairs. Ocellar tubercle and median furrow present; frontal chætotaxy normal, except that the four proclinate bristles are of nearly equal size and placed in a curve, besides these there is only a single reclinate bristle in the lower row, quite close to the eye. At the lower margin of the eye is a row of stout, downwardly directed bristles. Palpi very small. Antennæ yellow, with a pubescent arista. Thorax somewhat shining, black pubescent, with two scutellar bristles and a single pair of dorsocentrals. Abdomen yellow, the second to fifth segments with a small black spot at the side anteriorly; tip of abdomen black. Second segment with a few weak bristles laterally. Legs yellow, except the tips of the hind femora, which are blackish; posterior tibiæ with a black line above and distinctly ciliated with delicate bristles. Wings yellowish, the veins very strong, fuscous; costa extending to the middle of the wing, with closely placed, very short bristles, first vein ending a little nearer to the tip of the third than to the humeral cross-vein; fourth vein evenly curved.

Described from a number of specimens,—one from Atco, N. J.; one from Natrona, Pa. (Johnson); several from Wood's Hole, Mass. (Melander and Brues).

This species closely resembles *flava* Fallen, but differs by the arrangement of the frontal bristles.

**Aphiochæta lutea** Meigen. (Plate vii, fig. 31.)

Meigen, Syst. Beschr. vi, 220.
Fallen, Dipt. Suec., Phhytomyzides, 7, 8.
Macquart, S. à Buffon, ii, 628, 18.
Zetterstedt, Ins. Lap., 797, 11.
Zetterstedt, Dipt. Scand., vii, 2877.
Becker, Monog. Phoridæ, p. 54.

Length 2 mm. Wholly yellow; dorsum of thorax very slightly shining, with only two scutellar and one pair of dorsocentral macrochætæ. Front yellow or somewhat gray pollinose. Antennæ bright yellow, as are also the palpi; antennal arista pubescent; two strong macrochætæ just below the eye. Abdomen usually dull yellow; dorsum often infuscated or yellow, with lateral black spots on the third and fourth segments. Legs bright yellow, darker on the tips of the femora. Hind tibiæ with a black line above and a row of delicate setulæ. Wings yellowish; veins of the same color. Costal vein reaching to the middle of the wing, its bristles rather long; first and second longitudinal veins slightly more approximated than in *flava* Fall.

There are numerous specimens from Opelousas, La. (Hough), and Wisconsin (Wheeler), which agree well with European specimens of this species. The abdomen varies considerably in color, but otherwise I can detect no differences.

**Aphiochæta fungicola** Coq. (Plate vii, fig. 32.)

Coquillett, Canadian Entomologist, xxvii, 106 (1895).

Black, subshining, dorsum often brown, antennæ and halteres concolorous; the palpi and the legs, including front coxæ, yellowish. Dorsum with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Tibiæ destitute of stout setæ on the outer side, hind ones microscopically setulate; costal vein not quite extending to the middle of the wing, ciliate with short bristles. Third vein forked near the apex; tip of first vein just beyond the middle of the distance between the humeral cross-vein and tip of the third vein; fourth vein gently curved for its whole length, the cell in front of it scarcely wider than the narrowest part of the one behind it. Abdomen bare in both sexes.

Length 1–1.5 mm.

Type locality, Las Cruces, New Mexico (Cockerell).

Bred from larvæ infesting a tree fungus (*Trametes peckii*), which was inhabited by coleopterous insects belonging to the genus *Cis*.

I have examined three female specimens, from the original type lot, very kindly loaned by the U. S. National Museum. The hind femora are quite broad, darkened at the tips and fringed below on basal half with curved black hairs.

I have a number of specimens from New Bedford, Mass. (Hough), and Ithaca, N. Y. (Comstock), which come very close to this species. They differ by their light-colored halteres. These I have designated as *fungicola* var. in the table of species.

**Aphiochæta nigriceps** Loew. (Plate vii, fig. 34.)

1866. Phora nigriceps, Loew., Centuries, vii, 99.
1879. Phora aletiæ, Comstock (teste Coquillett), Rept. U. S. Dept. of Agriculture, pp. 208–211.
1892. Phora nigriceps, Aldrich, Canad. Ent., xxiv.
1895. Phora nigriceps, Coquillett, Canad. Ent., xxvii, 103.

Yellowish, the color of the thorax often varying into red, sometimes into brown. Head black; front wide, subconvex, lightly punctulate, with a very faint, median, longitudinal, impressed line; the anterior setæ directed downward. Antennæ black, in immature specimens brown; palpi yellow. Pleuræ below the wings and between the middle and hind coxæ generally with black markings. Metanotum generally brown or blackish. Abdomen in immature specimens wholly clay-yellow, in mature ones the first segments, except the posterior margins, almost entirely brown, the remainder with brown sides. Feet pale yellowish, extreme apex of the hind femora black, front tibiæ without setæ, the others with a single row of very minute setulæ above. Halteres yellow; wings subhyaline, very slightly tinged with grayish yellow; costa with small cilia; veins brown, second heavy one forked, the fourth light one entire and distinct.

Original description translated.

Thorax with two dorsocentral macrochætæ and four marginal scutellar bristles. Cheeks each with two stout macrochætæ. First vein ending midway between humeral cross vein and tip of third vein; costa ending beyond the middle of the wing, its bristles rather short. Palpi of ♂ with very small bristles and distinctly enlarged.

This form is related to *P. picta* Lehm, but differs by its black head and the longer bristles on the costal vein.

New Bedford, Mass. (Hough); Algonquin, Ill. (Nason); Knoxville, Tenn. (Summers); Ithaca, N. Y.; Austin, Texas, bred from an artificial nest of the ant *Pogonomyrmex barbatus* (Wheeler); Wood's Hole, Mass. (Brues).

This is a species which is widely distributed in the eastern part of the country, and is by far the most variable one that I have examined. The lateral pair of scutellar bristles varies from extremely small to the size of the other pair. The color also varies greatly. The head is always black, but the rest of the body may be pale yellow or brownish.

Specimens from New England and the northern parts of the country are the most typical and agree very well with the original types at Cambridge, with which I have compared them.

**Aphiochæta scalaris** Loew. (Plate vii, fig. 33.)

Loew, Centuries, vii, 100.

Length 2.5–2.6 mm. Yellowish, the color of the thorax sometimes a little darker. Head, antennæ and palpi yellowish; front broad, subconvex, finely punctured, and with a fine median impressed line; both pairs of proclinate setæ well developed. Pleuræ immaculate, dorsum with one pair of dorsocentral macrochætæ and four marginal scutellar bristles; metanotum yellowish. Abdomen luteous or ochraceous, hind margin of first segment narrowly, the side and hind margins of the other segments very broadly black. Legs pale yellow, the

apices of the hind femora black. All the tibiæ ciliated above with setulæ, those on the four posterior tibiæ being very distinct. Wings subhyaline, very faintly yellowish, costal bristles rather short, veins dark, seventh vein distinct.

Represented by specimens from St. Vincent and Grenada, W. I. Some of these I have compared with the original types in the Museum of Comparative Zoology at Cambridge. They agree well in all details. There are also two specimens—one from Natrona, Pa., and one from Philadelphia, Pa. (Johnson)—which are less typical, but belong to this species.

**Aphiochæta aurea** Aldrich. (Plate vii, fig. 35.)

Aldrich, Trans. Ent. Soc. Lond., 1896, 437.

Yellow, lower frontal bristles proclinate, second vein forked, the abdomen, or at least the dorsal part, reddish orange in color. Front, antennæ and palpi yellow, arista yellow at base. Dorsum with one pair of dorsocentral macrochætæ and four marginal scutellar bristles; thorax wholly yellow; halteres yellow, in some cases brownish about the apex. Legs wholly yellow, the tarsi scarcely darker; middle and hind tibiæ each with a row of nearly a dozen small bristles, running down the posterior edge; hind femora moderately thickened, with a few very small bristles below near the tip. Abdomen bright reddish-orange in color, toward the apex and below irregularly blackened. In one specimen, a male, the reddish color is confined to the base, and there is a well-defined black spot on each side of the middle of the dorsum. Wings quite deeply tinged with yellow, the heavy veins reaching far out beyond the middle of the wing; costal bristles very short; fourth vein but little curved, ending at or but little before the apex of the wing; tip of first vein about equally distant from the humeral cross-vein and from the tip of the third; seventh vein distinct to the border.

Length 1.3–1.7 mm.

I have seen the original types from St. Vincent, W. I., and also several specimens from the Island of Grenada, W. I.

This species is remarkable for the extreme length of the costal vein and the bright orange-red color of the abdomen. It comes very close to *scalaris* Lw., but the costa is longer and its cilia are stouter and more thickly placed. The lower pair of proclinate setæ are also much weaker than in *scalaris*.

**Aphiochæta magnipalpis** Aldrich. (Plate vii, fig. 36.)

Aldrich, Trans. Lond. Ent. Soc., 1896, 438.

*Male.* Head, thorax, antennæ and abdomen black; palpi, pleuræ and halteres brownish black. The palpi in the male are enlarged, divaricate, and destitute of the usual strong setæ. Thorax with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Wings hyaline, the light veins very slender, tip of first vein just midway between the humeral and the fork of the third, on the costa. Fifth vein with a much greater curvature than usual, almost parallel with the vein before it, ending but little behind the apex of the wing. Legs rather stout, hind tibiæ not ciliate with bristles, or setulose.

Length 1–1.25 mm.

St. Vincent, W. I., sea level to 1000 feet, May. Four males and four females. The female is lighter and more variable, and has the palpi normal.

Besides the original specimens from St. Vincent, there are in the material at hand ten specimens of both sexes from the Island of Grenada, W. I. The female of this species is most easily recognized by the peculiar curvature of the fifth vein in the wing.

**Aphiochæta giraudii** Egger.

Egger, Verh. d. k. k. zool-bot. Gesell. (1862), 1235.
Slosson, Entomological News, vi, 7 (1895).
Becker, Monog. Phoridæ, p. 58 (1901).

Thorax reddish brown or black, scutellum with four bristles. Abdomen black, with very narrow yellow bands. Halteres and legs yellow; hind femora distinctly blackened, their tibiæ with distinct ciliation above. Costal vein reaching slightly beyond the middle of the wing. Tip of first vein very near to the second, twice as far from the humeral cross-vein; fourth vein recurved at the tip. Head black, antennæ fuscous, palpi yellow.

This European species was first found in North America by Mrs. Slosson, in the White Mountains, New Hampshire. I have seen no American specimens.

**Aphiochæta halictorum** M. et B. (Plate vii. fig. 37.)

Melander and Brues, Biological Bulletin, v, 14 (1903).

Head black, subshining; antennæ black; palpi dull yellow; front long, flattened, punctured and shining, its bristles small, the middle row high up; proclinate ones small. Dorsum black, subshining, finely pubescent, the pleuræ lightly pruinose, ten bristles present on the hind edge of the mesonotum, dorsum with one pair of dorsocentral and four marginal scutellar bristles. Abdomen black, shining, lightly pruinose basally along the sides. Legs piceous, front legs somewhat lighter, front coxæ dull yellowish, middle and hind coxæ piceous. Hind femora rather stout; all the tibiæ with short bristles, biserially arranged on their outer side, those of the front tibiæ ten to twelve in number and approximated into one line towards the inner forward edge; those of the other tibiæ in two separated series; hind tibiæ with seven in the outer and ten in the inner row. Middle tibiæ with one long spur, hind ones with two moderately long ones. Wings hyaline; heavy veins nearly black, reaching nearly to the middle of the wing; costal bristles fine and short, thickly placed; fourth vein slightly flexed only at its extreme base; seventh vein distinct. Halteres pale.

Length 1.5–2.25.

This species is distinguished by the presence of four scutellar bristles and the row of small bristles on the middle and hind tibiæ. It is a very distinct species.

**Aphiochæta minuta** Aldrich. (Plate vii, fig. 38,)

Aldrich, Canadian Entomologist, xxiv, 146.

Head black; the front broad, shining, convex, with a few minute hairs slant-

ing toward the middle line; the usual bristles rather small; ocellar prominence defined by a very fine impressed line which continues down the front. Antennæ brownish black. Palpi brownish, with a few black bristles at the tip. Proboscis small, yellow. Dorsum of thorax with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Abdomen black, tapering in the female, with the last segment slender and cylindrical. Halteres light yellow. Wings infuscated with brown, except toward the posterior border; costal vein not reaching quite to the middle of the wing, with short and delicate bristles; third vein furcate. Light veins four in number; fourth vein nearly straight. Front legs yellow at the coxæ, gradually browner toward the tarsi, without any conspicuous bristles; middle legs brown, with a long spur at the apex of each tibia. Hind legs black, apex of each tibia with a single long spur; about seven short bristles form a row down the back side of the apical half of the tibiæ.

Length 1.2 mm., of wing 1.3 mm.

Type locality, Brookings, South Dakota. Bred from a cocoon of *Cimbex americana* Leach, which emerged June 1st.

Numerous specimens which agree well with the type. Nearly all, however, are larger and darker, especially the palpi and legs, which are often blackish. The wings are also quite strongly infuscated in fully mature specimens. The palpi are rather broader at the tips than usual.

South Dakota (type, Aldrich); New Bedford, Mass. (Hough); Boontown, N. J. (Greene); Hagerman, Idaho (Aldrich); Ithaca, N. Y. (Comstock); Monterey, Cal. (Wheeler), and Salinville, Ohio.

This species is very readily recognized by its long and narrow brownish wings and stout posterior tibiæ, which are very strongly setulose.

**Aphiochæta furtiva** Aldrich. (Plate vii, fig. 39.)

Aldrich, Trans. Ent. Soc. London, 1896, 436.

*Female.* Head, thorax and abdomen black; legs brownish, the tarsi and anterior tibiæ yellow. Front black; the bristles rather below medium size, the fine hairs somewhat conspicuous. Antennæ blackish, more or less yellowish at base; palpi yellow. Dorsum of thorax subshining, with one pair of dorsocentral macrochætæ and two marginal scutellar bristles; pleuræ shining black. Halteres black. Femora in fully colored specimens dark brown, in less mature ones yellowish brown, the tibiæ lighter; hind tarsi almost twice the length of the tibiæ. Hind tibiæ on the posterior edge delicately lined with black, on the inner side of this with a row of about twelve setulæ. Wings slightly yellow, the heavy veins reaching well past the middle of the wing, first vein reaching barely more than half way from the humeral vein to the fork of the third, on the costa; fourth and fifth veins ending about equally far from the apex of the wing; seventh vein almost obsolete.

Length 1.5 mm.

This species comes nearest to the European *ciliata* Zett., from

which it differs in not having the hind femora enlarged; the costal vein is longer also, and the halteres black.

Besides the types of this species, I have seen two additional specimens from St. Vincent. All are females. The altitudes at which the specimens were captured vary from sea-level to 1500 feet.

**Aphiochæta rufipes** Meigen. (Plate vii, fig. 40.)

Meigen, Classification, i, 313, 3.
Zetterstedt, Ins. Lapp., 795, 3.
Zetterstedt, Dipt. Scand., vii, 2857.
Schiner, Fauna Austr., ii, 340.
Coquillett, American Naturalist, xxxi, 386.
Coquillett, Proc. Wash. Acad. Sci., ii, 437.
Becker, Monog. Phoridæ, p. 59.

*Male.* Length 2.5-3 mm. Thorax and abdomen black, the former somewhat shining, on the dorsum with unusually thickly placed short brown hairs. Scutellum with only two marginal bristles, and dorsum with one pair of dorsocentral macrochætæ. Head and antennæ black, third antennal joint of moderate size, with a long pubescent arista. Front gray pollinose, its bristles placed as usual; palpi yellow, with long bristles; head with a row of long bristles reaching up from the border of the eye to the middle of the face. Halteres yellow. Abdominal segments rather thickly covered with long, perfectly erect, blunt bristles; the sutures between the segments often yellow. Legs and coxæ varying from brown to reddish yellow; hind femora not especially widened, usually a little darker at the tips. Wings hyaline; the costal vein reaching about to the middle of the wing, its bristles very long; first segment of the costal vein about one and one-half times as long ss the second.

The female lacks the peculiar abdominal bristles which are so conspicuous in the male.

There are about forty specimens before me, representing both sexes of this species, from various parts of the United States, as follows: New Bedford, Mass. (Hough); Moscow, Idaho (Aldrich); Michigan; Pennsylvania; Algonquin, Ill. (Nason); New York City (Brues); Chicago, Ill. (Melander).

From this it can be seen that the species is very widely distributed in this country.

All agree exactly with the description given by Becker of European specimens, of which I have given a translation above.

**Aphiochæta albidohalteris** Felt.

Felt, Twelfth N. Y. Report, 228.

*Female.* Head and thorax jet black; palpi orange yellow; abdomen black in some specimens, in others the lateral margins and dorsum of terminal segments are dull yellow. Wings hyaline, heavy veins ochreous. Halteres brownish black at base, the knob yellowish white; legs a variable ochreous, with the terminal

segments darker. Ocellar triangle defined by a suture which extends down the front; anterior frontal bristles proclinate. Dorsum of thorax dull, thickly pubescent, with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Costal vein less than half the length of the wing; first vein joining the costa near its apical third; third vein forked; costa fringed with strong bristles; fourth vein nearly straight. Fore tibiæ unarmed, middle and posterior ones fringed with stout spines posteriorly, each with a large apical spine. Tarsi about one-fourth longer than the tibiæ.—(Condensed and elaborated from original description.)

Length 1.92 mm., of wing 2.4 mm.

I have seen two females of the original type lot, which were very kindly loaned to me by Mr. C. W. Johnson. This species comes very close to the European *rufipes* Meig., but the females differ from those of *rufipes* in having the fourth vein evenly curved for its entire length. The costa is also a trifle shorter, not quite reaching to the middle of the wing, and the first vein ends nearer to the tip of the third.

Type locality, New Brunswick, N. J.

I cannot find the stout spines mentioned in the description of the posterior tibiæ. In the two specimens which I have seen the tibiæ show only a faint suggestion of ciliation.

**Aphiochæta agarici** Lintner. (Plate vii, fig. 41.)

Lintner, Tenth N. Y. Report, p. 399.

Aldrich (*P. setacea* female, nec male), Canad. Ent., xxiv, 141, figs.

*Male and female.* Black, antennæ fuscous; knob of halteres yellowish white, front and middle legs yellowish brown, tarsi brownish, hind legs darker; palpi yellowish. Wings hyaline.

Ocellar triangle defined by a suture which extends down the front; anterior frontal bristles proclinate. Dorsum of thorax thickly pubescent, with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Costal vein not reaching to the middle of the wing. Apex of the first vein nearer to the tip of the second vein than to the humeral cross-vein; third vein forked; costal vein fringed with strong setæ; fourth vein curved both at the base and apex. Front tibiæ unarmed, middle tibiæ with a very long posterior apical spine; hind tibiæ with one long anterior and several short apical internal spines. Anterior edge of middle and posterior edge of hind tibiæ fringed with a thick row of stout setulæ; internally and closer to the hind margin of the hind tibiæ there is a row of about nine stouter spines on the apical three-fourths. Hypopygium of male with an irregular dorsolateral plate, the ventral portion of which is prolonged. Two pairs of organs extend from the plate, an upper straight pair bearing numerous long setæ along the entire surface, and a lower pair, slightly curved ventrally and bearing several long, usually sharply curved setæ at their tips.

Length 1.5–2 mm., of wing 1.75–2.25 mm.

Closely related to *P. setacea*, but in this species the anterior row of frontal bristles form a nearly straight transverse row, while in

*setacea* the middle ones are placed further forward than the lateral ones. The anterior pair of proclinate bristles are also relatively smaller and more nearly in front of the middle pair. The costal vein is much shorter in *agarici* and the first vein ends nearer to the tip of the third than in *setacea*.

The female which Aldrich described as *setacea* belongs to *agarici*, while the male, which is a distinct species, stands as the type of *setacea*.

**Aphiochæta setacea** Aldrich. (Plate viii, fig. 42.)

Aldrich, Canadian Entomologist, xxiv, 144, figs.

Head black, front very wide, with an ocellar prominence and median furrow. All the frontal bristles large and strong, the four anterior ones proclinate. Antennæ fuscous, palpi yellow with black bristles. Dorsum of thorax clothed with brownish pubescence; scutellum with two marginal bristles. Legs yellowish, hind pair brownish, posterior tibiæ each with a single spur. Coxæ with a few bristles on the outer and apical portions; the posterior coxæ with a conical protuberance on the hind side. Hypopygium lying close up under the back part of the abdomen. Wings slightly grayish, veins yellowish brown, costa reaching nearly to the middle of the wing, provided with very long bristles. First vein ending midway between the humeral cross-vein and the tip of the third, fourth vein not much curved, almost straight except at extreme base and apex, seventh vein distinct. Halteres yellow.

Length 1.2 mm., of wing 1 mm.

Type locality, Brookings, South Dakota.

This species is closely related to the European *P. rufipes* Meig., but lacks the peculiar bristles upon the abdomen of the male. The female is very much like *rufipes*, and when not associated with the male is almost impossible to distinguish. The costal bristles are, however, a little shorter and the wing more strongly tinged with yellow. Many specimens are considerably larger than the type (2–2.5 mm.)

**Aphiochæta rostrata** M. et B. (Plate viii, figs. 43, 44.)

Melander and Brues, Biological Bulletin, v, 15 (1903).

*Female.* Length 1.5 - 1.75 mm.—Head shining black, especially smooth and polished on the front and vertex. Front with the normal chætoxy, except that there are only two proclinate bristles at the lower edge. The front is also sparsely hairy, besides the large bristles; median longitudinal groove and ocellar tubercle unusually well marked. Antennæ black, arista distinctly plumose. Proboscis piceous, very large and strongly exserted, as long as the head height. It is rather slender at the base where the rather small bristly spindle-shaped black palpi are inserted, swollen and bifurcated at the extremity. The bifurcation is produced by a splitting of the apex by a horizontal slit in the probocis. Thoracic dorsum shining, hairy as usual, with one pair of dorsocentral and two marginal

scutellar bristles. Abdomen black, nowhere bristly. Legs pale yellow, the tarsi sometimes brownish, hind tibiæ very distinctly ciliated and with a single weak spur, as have also the middle pair. On the inner side at apex, the posterior pair have several transverse rows of short black bristles. Wings yellowish hyaline, the costal vein reaching distinctly beyond the middle of the wing and with very short cilia; first vein ending a little closer to the tip of the second than to the humeral cross-vein; fourth vein evenly arcuate, fifth vein sinuate as is also the sixth; seventh vein present. Halteres yellowish, blackened at the tips.

The original types from Wood's Hole, Mass., are before me.

This species can easily be recognized by the peculiar form of the proboscis in the female. The shiny black head and thorax and contrasting light yellow legs are also quite characteristic.

**Aphiochæta pulicaria** Fallen. (Plate viii, fig. 45.)

Fallen, Dipt. Suec., Phytomyzides, 7, 6.
Meigen, Syst. Beschr., vi, 217, 16.
Zetterstedt, Ins. Lapp., 754, 4.
Schiner, Fauna Austriaca, II, 341.
Strobl, Phoriden Oesterreichs, 202.
Becker, Monog. Phoridæ, 62.

*Male.*—Head, thorax and abdomen black, sometimes slightly brownish. Thorax covered with short brownish pubescence; but little shining; with a single pair of dorsocentral macrochætæ and two marginal scutellar bristles. Third antennal joint of medium size, with pubescent arista. Palpi yellow or reddish brown. halteres yellow or yellowish brown. Abdomen dull black, sometimes brownish. Legs varying from yellowish to dark brown; hind femora rather wide and darkened toward the tips; hind tibiæ with a black line above, very delicately ciliated. Wings often slightly tinged with brown, the veins brown; costal vein reaching to the middle of the wing, with long and well separated bristles; tip of first vein about one and one-half times as far from the humeral cross-vein as from the tip of the third.

There is a large number of specimens before me which agree well with European specimens from Strobl and with Becker's description of this species. Very often the body is brownish and the wings clear hyaline, but all seem undoubtedly to belong to this species.

The species is very widely distributed in Europe, Siberia, Northern Africa and the following localities in the United States: Massachusetts, Louisiana, South Dakota, Idaho and California. It is therefore practically circumpolar in its distribution.

**Aphiochæta cata** M. et B.

Melander and Brues, Biological Bulletin, v, 16 (1903).

*Male and Female.* Length .8—1.2 mm.—Head black, front short, as about as wide as long, subshining, faintly gray pollinose in the male, two anterior bristles proclinate, the others all present and arranged as usual. Antennæ wholly black in the male, in which sex the third joint is enlarged and ovate so as to be very

conspicuous; in the female they are of the usual size and slightly yellowish at the base; arista pubescent. Palpi light yellow, strongly bristly. Proboscis of female projecting, stout and horny. Thorax shining black, hairy, with one pair of dorsocentral and two marginal scutellar bristles. Abdomen black. Legs yellowish brown, the anterior pair lighter. Posterior femora ciliated below on apical half, their tibiæ without any rows of small bristles on the outer side; four posterior tibiæ each with a single delicate apical spur. Wings hyaline, the costal vein not quite reaching to the middle of the wing, its cilia short and closely placed. Third vein far from the costa at its base and forked very near the apex. Tip of first vein one and two-thirds times as far from humeral vein as from the tip of the third; fourth vein slightly but evenly curved, recurved at the extreme tip; fifth vein slightly diverging from the fourth to its tip, which is as far behind the wing tip as the fourth is before it; seventh vein faint but distinct. Halteres yellowish in the female, piceous in the male.

I have seen only the original types of this species, which are from Wood's Hole, Mass.

It is quite easily known by the stout, horny proboscis of the female and the enlarged third antennal joint of the male.

**Aphiochæta** (?) sp. innom. (Plate viii, fig. 46.)

There is a single male, collected by Mr. C. W. Johnson, at Delaware Water Gap, N. J., July 12th, which belongs to an undescribed species. As the antennæ and palpi of the specimen are lost, I have not undertaken to describe it. It can be readily recognized by the fact that the hind tarsi are enlarged and flattened (see fig. 46). *Dahli* Beck. and *coronata* Beck. have the fore tarsi enlarged in the male, but this is the only form, so far as I am aware, in which the hind tarsi are peculiar. There are no proclinate bristles on the front, but the absence of bristles on the legs and the presence of a median furrow on the front indicate its position here. There are only three rows of frontal bristles, the lower two of which consist of two median reclinate bristles only.

**APOCEPHALUS** Coq.

Coquillett, Proc. Ent. Soc. Wash., iv (1901).

Head hemispherical, eyes large, Front broad, its bristles all reclinate, arranged in four rows; anterior row consisting of two median, next row of two, and two upper rows each of four bristles. Ocelli large. Antennæ large, their cavities small, third joint oval or conical, with an apical arista. Proboscis small, palpi with few and very weak bristles. Thorax strongly arched above. Wings large, the third vein forked near the apex, four light veins present. Legs rather long and slender, without bristles except for one tibial spur on each of the pos-

terior legs, hind tibia with fine setulæ. Ovipositor of female very stout and heavily chitinized, black, more or less shovel-shaped and blunt at the tip.

This genus resembles *Melaloncha*, but differs by the broad front, bare legs, forked third vein, and blunt ovipositor. It is represented by two species, both from the United States.

*Table of Species.*

1. Ovipositor shovel-shaped, twice as long as broad, broad at base and equally so at apex, constricted at the middle. Front black. . **pergandei** Coq.
Ovipositor narrow, pointed bluntly at the apex, four times as long as broad. Front yellow . . . . . **wheeleri** sp. nov.

**Apocephalus pergandei** Coq. (Plate viii, figs. 47, 48.)

Coquillet, Proc. Ent. Soc. Wash., iv (1901).

*Female.* Length 2 mm.—Yellow, except front, ovipositor and markings upon abdomen. Front black, not shining, about as broad as long, ocellar tubercle and impressed median line very distinct, bristles of second frontal row two in number and placed near to the eye margin. Antennæ lemon-yellow, third joint oval, rather large, with a short, almost bare black arista. Palpi very small and hardly at all bristly, yellow. Cheeks each with two rather small macrochætæ. Thoracic dorsum yellow, with a single pair of dorsocentral macrochætæ and two strong marginal scutellar bristles. Second to fifth abdominal segments each with lateral black spots; second also with a pair of more median ones; sixth segment black, ovipositor piceous; venter yellow, except the last segment which is black; sides of all the segments, especially the third to sixth, fringed with stiff black hairs. Ovipositor flat, shovel-shaped, twice as long as broad, as wide at apex as at base and constricted in the middle. Legs pale yellow, hind tibiæ and all the tarsi lined with black. Hind tibiæ delicately setulose behind, their femora weakly ciliated with black hairs below near the apex. Spurs of middle and hind tibiæ long. Wings rather long and of even width, costal vein reaching not quite to the middle of the wing, its cilia very fine and closely placed. First vein ending two-thirds of the way from the humeral cross-vein to the tip of the costal; second vein very close to the third at its tip, *i. e.*, angle of furcation very acute; fourth vein evenly curved, seventh vein distinct. Halteres pale, black at extreme tips.

I have seen two females belonging to this species,—one from Frankford, Pa., collected by Mr. H. W. Wenzel, and kindly loaned to me by Mr. C. W. Johnson, and another specimen from Austin, Texas, found in a nest of *Camponotus maculatus*, var. *sansabeanus* Bkly., by Mr. A. L. Melander.

**Apocephalus wheeleri** sp. nov. (Plate viii, fig. 49.)

*Female.* Length 2 mm., of wing 2.7 mm. Wholly yellow, ocellar tubercle, a spot below each wing and posterior part of middle coxæ brown, ovipositor shining black. Head yellow, front more than twice as wide as long. The bristles of the second frontal row placed in the middle and almost above the lowest pair of re-

clinate ones. Third joint of antennæ are very large, broadly lancet-shaped with a very short, stout and bare, black apical arista. Palpi slightly elongated and projecting, with only very weak bristles below. Cheeks each with two small macrochætæ. Thoracic dorsum yellow, with a single pair of dorsocentral macrochætæ and two strong marginal scutellar bristles. Abdomen without hairs laterally, the sixth segment elongated. Ovipositor narrow, pointed bluntly at the apex, four times as long as broad. Legs very long and slender; hind tibiæ lined with black above and obsoletely setulose. Wings yellowish hyaline, very large; the costal vein reaching to the middle of the wing, its cilia of moderate length, but close and very fine. Tip of first vein scarcely nearer to the tip of the costal than to the humeral cross-vein; second vein not close to the third at its apex, *i. e.*, angle of furcation not very acute; fourth vein slightly and evenly curved; seventh vein distinct. Halteres pale yellow.

Described from a single female collected at Pine Lake, Wis., June 7, 1890, by Dr. Wm. M. Wheeler, after whom I take great pleasure in naming this species.

The appearance of the female palpi indicates that in the male these organs will be found to be much enlarged.

The habits of the present species are not known, but close structural similarity with *A. pergandei* suggest that it probably lives parasitically on ants, like the latter.

### MELALONCHA gen. nov.

Moderately large species with long and narrow wings; head hemispherical; eyes large. Front narrow, twice as high as broad and with no median groove or ocellar tubercle. Frontal bristles all reclinate, in four transverse rows; the ocellar row consisting of four bristles and the lower ones of two each, the median ones being absent in these rows. Antennæ inserted very low down; elongate oval, pointed at tip and with apical arista. In addition to being greatly elongated they are curved upward, due to an arcuation of the third joint. Palpi small, with delicate bristles. Thorax and abdomen normal in the male. In the female the abdomen is very slender and ends in an asymetrical, sharply pointed, very heavily chitinized ovipositor. Anterior *femora* each with a small macrochæta on outer side just before the knee. Middle tibiæ with no bristles except a single apical spur. Posterior femora rather slender in the female, stouter in the male. Hind tibiæ fringed above in both sexes with a series of stout bristles; with two apical spurs. Wings longer and narrower than usual, costal vein with minute bristles; third vein not forked at tip; four light veins present. Pulvilli and empodium well developed.

**Melaloncha pulchella** sp. nov. (Plate ix, fig. 60.)

♂, ♀. Length 2 mm., of wing the same. Head deep orange, macrochætæ and interocellar space black. Front shining, highly polished. Antennæ and palpi lighter yellow, especially the palpi; arista piceous, swollen at base, finely pubescent. Palpi with very delicate bristles. Dorsum of thorax piceous black in the male, brownish yellow in the female. Pleuræ black in the male, with a large yellow mark just below the humeri; in the female wholly yellow. Thorax with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Abdomen of male black, in certain lights with a very fine bluish iridescence in bands anteriorly on the segments; female abdomen black, with yellow bands anteriorly on each segment, the yellow being pruinose with bluish white, as in the male. Sixth segment twice as long as the others; ovipositor narrow, black, polished and pointed; as long as the rest of the abdomen. Seen from the side, it is slightly arcuate downward; from above it is asymetrical, being bent toward the left just beyond the middle. Legs yellow, except the hind tibiæ and apical part of hind femora in the male. Posterior tibiæ fringed above in both sexes with a series of very large bristles, which are longest apically. Wings distinctly brownish; nervures piceous, costal vein reaching to the middle of the wing, its bristles extremely minute. First vein ending a little nearer to the third than to the humeral cross-vein; veins four to seven strong, but little curved. Halteres yellow.

Described from a single male and female from Songo, Bolivia, South America (Kertész).

This peculiar form is represented in the collection by a pair of specimens (♂, ♀), which were very kindly sent by Dr. Kertész. Its general appearance recalls at once the genus *Apocephalus*; but it is seen to differ from the latter by the shape of the front, the simple third vein, and form of wings and bristles on hind tibiæ. So similar are the antennæ and ovipositor in the two genera that one can almost predict that its habits will be found to resemble closely those of *Apocephalus pergandei*.

I have seen only the description of the European *Phora formicarum* Verrall, but it evidently has some affinities with the present species. There are so many differences, however, that a comparison only could determine their generic relations.

The *Phora stylata* of Schiner (Novara Reise, Dipt. 224), from the description, is evidently very closely allied to this species, and I do not hesitate in placing it here. It differs from *M. pulchella* in color and in the form of the ovipositor, which is provided with two points at the apex instead of one, as in *pulchella*.

## TRINEURA.

Meigen, Illiger's Mag., ii, 276 (1803).
Meigen, Klassif., 312 (1804).

Front in the male rather narrow, only about one fifth the width of the head, in the female one-third or one-fourth. Frontal bristles twelve in number, all reclinate, the lower ones in the middle smaller than the others; arranged in four transverse rows, on the vertex four, then follow three rows each of two lateral bristles; below the ocelli are two more bristles which are somewhat nearer to the middle. Cheeks without bristles. Fore tibiæ unarmed, middle tibiæ on the posterior part of the upper surface with a row of very long setæ in the male, four to six in number, in the female only two, rarely three. In both sexes there are setæ also on the fore and hind tibiæ. Dorsum of the thorax with no longer hairs and bristles than in other genera; velvety; with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Third vein of wing not forked, first running parallel with the costa rather far from it, then making a somewhat abrupt turn toward it, ending about half way between the humeral and costal. Auxiliary vein distinct, ending in the first longitudinal just before the latter turns forward. Antennæ rounded, with dorsal arista, palpi small, bristly only at the tips. Eyes bare.

The venation and abundance of short velvety hair upon the dorsum of the thorax, afford the essential generic difference.

*Table of Species.*

1. Front tarsi not enlarged or widenend in either sex, costal vein not quite attaining the middle of the wing, third vein far from costa at base. **aterrima** Meig.

   Front tarsi enlarged and flattened in both sexes, more distinctly so in the female, third vein nearer to costa at base, costa reaching to or beyond the middle of the wing.....2.

2. Front tarsi very strongly flattened and enlarged, fourth vein curved at base, straight at apex, ending before the wing tip....**montana** sp. nov.

   Front tarsi distinctly flattened, but not remarkably enlarged, fourth vein evenly curved, ending just beyond the wing tip....**velutina** Meig.

Under the first species I have traced somewhat the history of the genus. When Meigen became acquainted with Latreille's description of the genus *Phora*, he considered that it covered the same ground and withdrew his own genus *Trineura*.*

The genus is represented in North America by three species, one (*aterrima*) originally described from Europe and first recorded from this side of the Atlantic by Walker in his "List" (1849), and

* See Appendix, Note 1.

again quite recently by Coquillett as occurring in Alaska, Colorado and New Hampshire; by a second European species (*velutina*), and by a third which has not heretofore been described. All have passed in American collections as a single species.

**Trineura aterrima** Meig. (Plate viii, fig. 50.)

1764. Mouche noire avec un trait noir sur la moitié du bord extérieur de l'aile. Geoffroy, Hist. abreg. d. Ins. d. env. Paris, ii, 533, 76 (Meigen).
1791. Musca aterrima, Fabricius, Ent. System., iv, 334, 93.
1799. Musca aterrima, Coquebert, Illust. icon. Ins., Pl. 24, fig. 3.
1802. Phora aterrima, Latreille, Hist. Nat. Crust. et Ins., iii, 464.
1804. Trineura atra, Meigen, Klass. u. Beschr. eur. zw. Ins. 1, 2, 313, Pl. xv, fig. 22.
1804. Phora aterrima, Latreille, Hist. Nat. Ins. et Crust., xiv, 394; Dict. d'Hist. Nat., xxiv, 197, 594.
1805. Tephritis aterrima, Fabricius, Syst. Antl., 323.
1809. Phora aterrima, Latreille, Gen. Crust. et Ins., iv, 360.
1823. Phora atra, Fallen, Faun. Suec. Phytomyzides, 7, 7 (Schiner); Meigen says *Trineura atra*.
1830. Phora atra, Meigen, Syst. Beschr., vi, 224.
1830. Phora stictica, Meigen, l. c., vi, 225.
1849. Phora aterrima, Walker, List. etc., iv, 1138 (occurrence in N. A.).
1864. Trineura aterrima, Schiner, Fauna Austr. Dipt., ii, 349.
1892. Trineura aterrima, Strobl. Wien Ent. Zeit., xi, 204. (Reduces stictica to a variety.)
1901. Trineura aterrima, Becker, Monog. Phor., p. 80.

Geoffroy evidently did not apply a scientific name to the species. Coquebert probably referred to the species as *Musca aterrima*, but I can find no positive statement. The chronological order of the three publications in 1804 is unknown. Meigen in 1830 regarded his genus *Trineura* (1803) as a synonym of *Phora* Latr. (1796). I have not ascertained the name under which Walker referred to this species, but Osten Sacken records it from North America on his authority. As far as I know, Schiner was the first to use the name *Trineura* after Meigen himself discarded it.

Wholly deep velvet-black, in the female a little less intense. Wings hyaline, the heavy veins usually black, but sometimes only the costa is black and the others brown, costal vein reaching a little less than half the length of the wing. Fourth vein only a little curved, ending at the apex of the wing, seventh vein wholly absent or very indistinct, legs velvety black, fore tibiæ and tarsi yellowish or reddish, male abdomen bent in a nearly uniform curve for the most of its length. Hypopygium in consequence turned partially forward. Front tarsi not enlarged, middle and hind tibiæ with a single external bristle on the basal half. Middle tibiæ of male with four to six bristles on the hind side, female with only two or three.

Twenty-nine specimens. From Dr. Hough, one, New Bedford, Mass.; Mr. Johnson, five, Montgomery Co., Pa., May 26, 1895, and six, Natrona, Pa., July 13–30, 1895; University of Kansas, two, Lawrence, Kans.; Prof. Aldrich, one, Brookings, S. D.; four, Lawrence, Kans.; Dr. Wheeler, two, Chicago, July, 1895–96; one, Battle Creek, Mich.; one, New York City, May (Brues); three, Austin, Tex., and four, Chicago (Melander).

**Trineura velutina** Meig. (Plate viii, fig. 51.)

Meigen, Syst. Beschr. vi, 224, 38.

Like *aterrima*, but a little larger. In both sexes the front tarsi are distinctly flattened and enlarged, this is especially noticeable in the female. The costal vein reaches a little beyond the middle of the wing, and the third vein is not so far from the costa at its base as in *aterrima*. Costal cilia long and fine, but not very close. Hind tibiæ with one external bristle; middle tibiæ with five to seven bristles on the hind side in the male and two to three in the female, besides one or two bristles on outer side before the middle.

This common European species has never before been recorded from America. The two species are very closely allied, but easily separable, by the characters given in the table. *Velutina* has the more western range, occurring from California east as far as Massachusetts. *Aterrima* occurs also in the east, but I have seen no specimens from further west than Kansas and Texas.

Thirty eight specimens. Eight, Leland Stanford University, Cal.; nineteen, Moscow, Idaho (Aldrich); four, Los Angeles Co., Cal.; three, New Bedford, Mass. (Hough); two, Douglas Co., Kans. (University of Kansas), and one from Battle Creek, Mich.

**Trineura montana** sp. nov. (Plate vii, figs. 52, 53.)

*Male.* Length 1.8–3.5 mm. Wholly dull, opaque velvety black, except coxæ, legs, hypopygium and several spots on the pleuræ which are more or less shining. Front about one-fourth the width of the head, with the normal bristles, the pair of bristles below the ocelli not so close to the eye margin as the others; lower part of front on each side of the median line with a vertical row of about five small bristles which decrease in size upward. Antennæ small, oval, with dorsal arista; palpi small, bristly only at the tips. Legs black, except the front, which are brownish yellow. Front tarsi much widened and flattened, wider than their tibiæ, second and following joints as wide as or wider than long; middle tibiæ with five or six (usually five) bristles on hind side, on outer side with a single bristle; hind tibiæ with a single basal external bristle. Wings hyaline, often tinged with yellowish; costal vein reaching well beyond the middle of the wing, its cilia very short and fine; fourth vein sharply curved at base, straight at apex, ending just before the wing tip.

*Female.* Differs by its wider front (one-third the width of the head) and by having only two bristles on the hind side of the middle tibiæ. The front tarsi are also a trifle wider than in the male.

Described from four males and four females, collected in the Magdalena Mountains, New Mexico, by the late F. H. Snow; and from a single male from Kansas.

This species is close to *velutina*, but can be distinguished by its shorter costal cilia, more broadly widened front tarsi, and by the sharper basal curvature of the fourth vein in the wing.

### **CONICERA** Meigen.

1830. Meigen, Syst. Beschr., vi, 226. Pl. lxiii, figs. 12, 13.
1864. Schiner, Fauna Austriaca, Dipt. ii, 335.
1835. Macquart, Hist. Nat. des Dipt. ii, 631. Pl. xxiv, fig. 6.

Third vein simple, mediastinal vein more or less obsolete. Tibiæ each with a single apical spur, outer side of middle and posterior tibiæ with two bristles near the base; pulvilli and empodia present. Antenna in male long and lancet-shaped, turned upward, the arista rather short, horizontal. In the female the third joint nearly round, yet with a distinct point where the basally thickened arista is inserted. Frontal setæ all reclinate, arranged in three rows; an upper one with four, a middle one of the same number, and a lower one of two setæ.

*Table of Species.*

1. Tip of male antenna reaching beyond the vertex, wings somewhat infuscated, middle tibiæ with four macrochætæ besides the apical spur.
**aldrichii** sp. nov.
Tip of male antenna not or just attaining the vertex, middle tibiæ with only three macrochætæ besides the apical spur.....2.
2. Wings pure hyaline, tip of antenna just reaching the vertex. ....**atra** Meig.
Wings brownish, tip of male antenna not extending so far as the vertex.
**atra** Meig. var., **neotropica** var. nov.

#### **Conicera aldrichii** sp. nov. (Plate ix, fig. 54.)

*Male.* Length 2.25 mm. Wholly black, nowhere shining; third joint of antennæ velvety black, produced into a very long point and reaching considerably above the vertex, feathered on its narrow portion; arista pubescent, thickened at base and a little shorter than the third antennal joint. Palpi prominent, slender, with numerous short bristles below. Thoracic dorsum opaque and sparsely black hairy; with a single pair of weak dorsocentral macrochætæ and a single large scutellar pair. Middle tibiæ with a pair of bristles at the basal third, another single one at apical third and a fourth just before the apex, besides an apical spur. Posterior tibiæ with a pair of bristles at basal third and a single one at apical third, besides a long apical spur. Wings slightly but distinctly infuscated, costal vein reaching nearly to the middle of the wing, rather more closely ciliated with moderately long bristles than in *C. atra*; third vein not so arcuate as in that species and less widely separated from the costal;

fourth vein curved at base and straight at apex, meeting the margin just before the apex of the wing; seventh vein distinct, reaching to the border of the wing. Abdomen dull black, not bristly; hypopygium reflexed narrowly at the base, and globular apically, finely hairy below. Legs and halteres black, the femora tinged with piceous.

Described from a single male specimen, collected at Julietta, Idaho, May 3, 1901 (Aldrich).

**Conicera atra** Meig. (Plate IX, figs. 55, 56.)

1830. Conicera atra Meigen, Syst. Beschr., vi, 226, 1. Pl. lxiii, fig. 13.
1830. Conicera sp. (?) Webster, Insect Life, 2, 356.
1901. Becker, Monog. Phoridæ, p. 81.

Dull black, the palpi and legs often brownish; dorsum of thorax slightly grayish and shortly black hairy, with two dorsocentral and two scutellar bristles; tip of male antenna reaching the vertex, the third joint being about two and one-half times as long as its greatest width. Palpi with rather weak bristles. Fore tibiæ with one bristle below the knee, middle tibiæ with a pair near the base and a third just before the apex, which bears a long spur. Hind tibiæ with a pair of bristles near the base and a third one near the middle, apical spur long. Halteres black; wings hyaline, the costal vein rather strongly ciliated, not reaching to the middle of the wing, tip of first vein almost three-fourths the distance from the humeral to the tip of the costal. Third vein considerably arcuate and distant from the costal for most of its course. Fourth vein uniformly curved, ending as far before the apex of the wing as the fifth vein does behind it. Sixth vein very indistinct at tip, and seventh almost wholly obsolete. Anterior legs usually somewhat yellowish, but this is rather variable.

The female has the third antennal joint shaped as in Phora, but with an apical arista; otherwise it agrees with the male.

Length 1–1.2 mm.

Numerous specimens of this common and widely distributed European species are in the collection, as follows: three males, two females, Washington, D. C. (Coquillett); two males, Horse Neck Beach, Mass. (Hough); two males, Delaware Water Gap, N. J. July 8 (Johnson); one female, Newark, N. J., June 14 (Johnson); one male, Battle Creek, Mich.; two females, Canada (Coquillett); one female, Sullivan Co., N. Y. (Brues).

The North American specimens agree almost perfectly with Becker's description of European ones except that the legs are slightly darker and there is much less variation in the size,—only 1–1.2 mm. instead of 1–2 mm., as given by Becker.

**Conicera atra,** var. **neotropica,** var. nov.

There is one male in the collection, from Grenada, W. I., which can scarcely represent a different species, but forms a well marked variety. The wings are decidedly brownish and not pure hyaline,

as in *C. atra*, and the third antennal joint of the male falls short of reaching the vertex. The chætotaxy and other characters do not differ, however.

## GYMNOPHORA.

Macquart, Histoire Naturelle des Dipteres, ii, 631. Pl. xxiv, fig. 5 (1835).
Schiner, Fauna Austriaca, Diptera, ii, 346 (1864).
Lioy, Atti. Soc. Veneti., 79 (1864).
Osten Sacken, Catalogue North American Dipt., 2nd Edit., 212 (1878).
(Refers to its occurrence in North America.)

"Palpi little protruding, with short hairs, front bare, very wide, last joint of antennæ globular. Feet bare; posterior femor not thickened. Wings not ciliated; marginal nervure bifurcated at its extremity; submarginal arcuated, not attaining the apex of the wing; median nervures sinuous (Pl. 24, fig. 5).

"*Phora arcuata* Meig. differs so much from the others in most of its characters that I have determined to separate it. The name I give to this genus makes allusion to the nudity of the principal organs."—Macquart, *l. c.*, translated.

This easily recognized genus, of which only one species is known, is distinguished, as above indicated, by the absence of setæ on the front, thorax, wings and legs, in fact by almost absolute nudity. In front of the wing are two or three fine hairs, and the vertical bristles of the head are also represented by four weak and short bristles on the vertex, but the apical spines of the tibiæ are absent. Scarcely less characteristic is the course of the fourth longitudinal vein, which curves forward and ends far before the tip of the wing. The third vein reaches considerably past the middle of the wing, and the first ends only a little before the second. The scutellum has only two small bristles, the dorsum of the thorax being bare otherwise. The pulvilli and empodia are present.

**Gymnyphora arcuata** Meig. (Plate ix, fig. 57.)

1830. Phora arcuata, Meigen, Syst. Beschr, vi, 222. Pl. lxiii, fig. 9.
1835. Gymnophora arcuata, Macquart, Hist. nat. d. Dipt. ii. Pl. xxiv, fig. 5.
1864. Gymnophora arcuata, Schiner, Fauna Austriaca, ii, 346.
1864. Lioy, Atti. Soc. Veneti., p. 79.
1864. Phora debilis, Haliday Entom. Mo. Mag., i, 179.
1878. Gymnophora arcuata, Osten Sacken, Cat. N. Am. Dip., 2d ed., 212.

Head and antennæ black, thorax, including pleuræ the same, abdomen more variable, the middle of the upper surface usually yellowish, venter yellow. Coxæ and feet yellow, posterior femora sometimes a little infuscated. Halteres clear yellow. Wings infuscated along the veins, which are blackish. Hypopygium of

male moderately large, black, with several small chitinous appendages more or less concealed.

Length 1.8 to 3.5 mm., of wing 2–3.7 mm. The smaller measurements belong to the males.

Seventeen specimens; nine from Lawrence, Kans. (a pair taken in copulation, June 2, 1893, measure 1.8 and 3.4 mm.); two from Milwaukee, June 28, '95; one Wisconsin, (Wheeler); one Natrona, Pa., July 12, '95 (Johnson); one Pine Lake, Wisconsin (Wheeler); one Austin, Tex. (Melander); two Woods Hole, Mass. (Brues).

All of these agree perfectly with European specimens determined by Strobl.

**Pachyneurella** gen. nov.

Head small; front short, twice as wide as long; with three rows of bristles, the two upper ones of four each, the next of only a single bristle at each side, besides two pairs of small proclinate bristles below. Antennæ with a perceptible point at the upper corner where the arista is inserted. Palpi normal, bristly. Tibiæ without setæ, even those at the apex being extremely minute. Third vein of wing not forked, first vein ending less than half way from the humeral to tip of costal; auxiliary vein distinct but short, ending in the first vein as usual, fourth to sixth veins very distinct, about half as heavy as the third vein, with which they appear to effect a direct union, instead of arising as a thin streak parallel to it; seventh vein distinct but lighter. Costal vein reaching to about half the length of the wing, ciliated with fine hairs not bristles. Empodia and pulvilli present, the former pectinated as in the female of *Wandolleckia*. Anal angle of wing without any bristles.

The heavy fourth to sixth vein, simple third vein and absence of tibial spurs are the main characters.

**Pachyneurella venata** Aldrich. (Plate ix, figs. 58, 59.)

Aldrich, Trans. Lond. Ent. Soc., part iii, 436 (1896) (*Phora venata*).

*Male.* Head and abdomen black; thorax brownish black; legs, including tarsi yellow; femora a little darker. Palpi brown, antennæ piceous, with strongly pubescent arista. Bristles of front small except on the vertex. Halteres very large, brownish black. Dorsum with one pair of dorsocentral macrochætæ and two pairs of marginal scutellar bristles. Under surface of fore femora with a row of delicate curved hairs. Pleuræ yellowish below. Hypopygium brown, with two black projecting claspers below, of which the left is fixed and the right movable; with a brownish lamella or backwardly projecting portion which is bristly. A yellow band just preceding the hypopygium at the tip of the last abdominal segment.

Length 1.3 mm., of wing 1.1 mm.

One male; St. Vincent, W. I. The type specimen, belonging to the Entomological Society of London.

**SYNEURA** gen. nov.

Wings with the third vein simple, not bifurcate. Front long, the sides nearly parallel; with three transverse rows of reclinate bristles, besides the four anterior proclinate ones. Antennæ with the second joint slightly oval, more pointed apically, with a dorsal arista. Palpi bristly below. Dorsocentral macrochætæ present. Hind femora thickened; four hind tibiæ each with two long apical spurs, and more or less spinulose along the outer edge. Mediastinal vein indistinct, empodia and pulvilli small but distinct.

This genus comes close to *Metopina* in some respects but is readily distinguished by the oval antennæ, the long spurs on the tibiæ and the different form of the front, the thickened femora, etc. It also resembles *Pachyneurella* but differs by its well developed tibial spurs, much lighter fourth to sixth wing veins, and the normal form of the ovipositor in the female.

The generic diagnosis is based upon *Phora coccipliila* Coq. which is the only described species possessing the above combination of characters. It is quite possible, however, that *Phora exempta* Beck. belongs with *coccipliila* in the present genus. Of this I cannot positively say, as I have not seen the European *exempta*.

**Syneura coccipliila** Coq.

Cocquillett, Canadian Entomologist, xxvii, 106.

Black, subshining, the under side of the third antennal joint and the palpi yellowish; halteres whitish. Front legs, including the coxæ, light yellow, the others brown. Wings whitish hyaline, costal vein not extending to the middle of the wing, ciliate with very short bristles; apex of first vein near the last fifth of the distance between the humeral cross-vein and the tip of the third vein; fourth vein nearly straight, the cell in front of it nearly twice as wide as the narrowest part of the one behind it. Abdomen bare in both sexes.

Length 75-1.25 mm.

Types. Twenty five specimens in the collection of the Department of Agriculture, bred in October and November, from larvæ infesting dead adults of *Icerya purchasi*, collected by Mr. C. H. T. Townsend at Magdalena, Victoria and Tamaulipas, Mexico.

By the kindness of Dr. L. O. Howard, I am enabled to examine some of the types. I do not know any member of the family in which the first and second veins end so near together. The heavy veins are very short and the light ones relatively long without any marked curves. The thorax is provided with a single pair of dorsocentral macrochætæ and two marginal scutellar bristles.

## METOPINA.

Macquart, Hist. Nat. des Dipt., ii, 666 (1835).
Strobl, Funde am Seitenst. (1880) (*Drepanophora*).
Six, Tidschr. voor Entomol., xxi, 126 (1879) (*Leptophora*).
Becker, Monograph Phoridæ, 83 (1901).

Wings with the third vein simple, not bifurcate; front with not more than two transverse rows of four bristles above; lower rows with only two in each row; anterior bristles proclinate. Legs without any bristles or stout hairs, tibial spurs obsolete; femora rather slender. Dorsocentral bristles sometimes absent. Antennæ placed in a deep cavity; spherical, with an apical arista. Eyes more or less hairy. Pulvilli reduced or wanting. Ovipositor of female not heavily chitinized.

This genus, first described by Macquart, was based upon *Phora galeata* Halidy. The type species has recently been described carefully by Mik (Verh. d. kk. Zool-Bot. Ges., 1880). It is represented in North America only by the following species.

### Metopina pachycondylæ sp. nov.

*Female.* Length 2 mm. Black, antennæ and legs yellowish brown. Front black, not shining, almost impunctured, distinctly wider than long, with two rows of transverse bristles, besides the four proclinate ones, and a series of five on each side next to the antennal cavity. Antennæ yellowish; second joint spherical; arista apical, very slightly pubescent. Ocelli very large. Palpi yellow, bristly near the tips only. Cheeks with two forwardly directed bristles. Thorax dull black, finely black pubescent, dorsocentral bristles wanting, scutellum with two marginal bristles. Abdomen blackish or brownish; pleuræ fuscous, varied with yellowish. Coxæ and legs yellowish brown; slender, without bristles and almost bare. Wings clear hyaline, heavy veins fuscous, light ones yellow, third vein ending in a sharp curve before the middle of the wing; costa with very fine and delicate bristles; first vein ending nearly twice as far from the humeral vein as from the tip of the third; fourth vein nearly straight, following veins feebly curved, seventh vein distinct. Halteres yellow.

Described from one of several specimens, reared by Dr. William M. Wheeler at Austin, Texas, in November, 1901. The larvæ live as commensals with the larvæ of the ant *Pachycondyla harpax* Fabr.

This form agrees with Becker's characterization of the genus *Metopina* in most repects and no doubt belongs here. The only great disagreement is in the form of the fifth, sixth and seventh veins in the wing. It agrees in the form of the antennæ, palpi, heavy wing veins, arrangement of frontal setæ and bare legs.

**PSYLLOMYIA** Loew.

1857. Loew, Wien. Ent. Monatsschr. Figs.
1901. Brues, American Naturalist, 1901, p. 343. Fig.
1901. Wasmann, Zool. Jahrb. Abth. f. Syst., 1901.
1901. Becker, Monograph Phoridæ, 87.

Head swollen, lentiform, completely chitinized. Eyes extremely small, on the sides of the head. Ocelli absent. Antennæ of medium size, arista pubescent. Palpi projecting, not very stout, bristly along the lower edge and at the tip. Proboscis very long, twice as long as the head height and geniculate. Thorax rounded, with bristles along the sides but without any dorsocentral or scutellar bristles. Abdomen and legs as in *Phora*, the latter very bare, only at the tips of the four posterior tibiæ with small short bristles. Wings abbreviated, leathery, resting upon the dorsum of the abdomen, a little longer than the thorax; with indications of three very thick, rib-like longitudinal veins, which are beset with small black bristles, some of which are noticeable because of their much greater length. Halteres almost rudimentary.

This was the first of the genera to be described which has reduced wings in the female sex. It is represented by the single species *P. testacea* Lw. from South Africa. It lives as a guest in the nests of the ant *Dorylus*.

**COMMOPTERA** Brues.

Brues, American Naturalist, 1901, p. 344.

Female. Small and rather stout species with reduced wings. Head with very large but rather shallow antennal cavities. Eyes small, about half as large as in *Phora;* ocelli absent. Antennæ rounded, a little pointed at the tip where an apical arista is inserted. Front short and broad, anterior frontal bristles porrect; besides these the front has only a single ocellar row of four bristles. Thorax about square; scutellum present, with two bristles, dorsocentrals wanting. Wings short, less than twice as long as the thorax, with long costal bristles; costa reaching to wing tip, where it meets the simple third vein. Abdomen entirely membranous except for four small dorsal plates, the last of which contains the opening of a gland. Legs moderate.

The only described species of this genus occurs in Texas in the nests of the common "Fire Ant," *Solenopsis geminata* Fabr.

The male sex is unknown.

**Commoptera solenopsidis** Brues.

Brues, American Naturalist, 1901, 344.

*Female.* Length 1.5 mm. Pale yellow, head somewhat darker, and abdomen a little lighter.

**PLATYPHORA** Verrall.

Verrall, Journal Linn. Soc., vol. xiii, 1877, p. 259.
Becker, Monog. Phoridæ, p. 88.

Body broad and much flattened, without any macrochætæ. Thorax transverse, abdomen small, third vein simple, costa weakly ciliated at the base.

Broad, flat, shining, frons very broad, the eyes scarcely occupying one sixth the width of the head. Antennæ with the third joint rather large, somewhat rounded. Thorax broad, flat, rather broader than the head. Scutellum margined, nearly four times as wide as long. Abdomen narrower and shorter than the thorax. Legs stoutish, middle tibiæ with two small spines at the tip. First vein ending just before the third which is not furcate.

(Condensed from the original description.)

This genus is represented by a single species, *P. lubbocki* Verrall, from England. As has been pointed out by Verrall, it is readily separated from all the other known genera of the family by the lack of bristles on the body, simple third vein and greatly flattened body. It has been suggested that this may be the male sex of the genus *Ænigmatias* Mien., of which only the wingless female has been described. This is only a supposition, however.

**ÆNIGMATIAS** Meinert.

Meinert, Entom, Meddel, 1890.
Becker, Monog. Phoridæ, 1901.
Brues, Amer. Naturalist, 1901.
Coquillett, Canad. Entom., Jan. 1903.

Head large and free. Antennæ and mouthparts of the usual type. Thorax not divided, first segment of the abdomen fused with the second; the following segments free, imbricate. Wings and halteres absent. Abdomen composed of four or five free segments. Legs slender, claws delicate as in other Phoridæ. Antennæ short, spherical, with a very long bare arista, which is obscurely two-jointed at the base. Palpi slightly clavate, bristly. Proboscis very small, the labellæ not distinct. Anterior femora very large, posterior ones conical. Abdomen compressed, brown or fusco-piceous, covered

with small hairs arranged in transverse rows, largest at the edges of the segments.

Only the wingless female of this genus is known, represented by the type species *E. blattoides* Mein., from Denmark, and by *E. schwartzii* Coq., from Arizona in this country.

*Table of Species.*

Abdomen with four free segments ..... **schwartzii** Coq.
Abdomen with five free segments ..... **blattoides** Mein.

**Enigmatias schwartzii** Coq.

Coquillett, Canadian Entomologist, xxv, 20.

Dark yellow, the posterior part of the body segments brown, most extended on the apical part of the abdomen, where it covers the genitalia and the greater portion of the last two segments; upper side of body opaque, distinctly whitish-pruinose, and with a short, sparse, yellowish-white pubescence, a row of short black bristles along the hind margin of each abdominal segment and a few shorter ones scattered over the last two segments; first thoracic segment (which comprises the prothorax and mesothorax) slightly over twice as long as the second, the latter almost twice as long as the first abdominal segment and subequal to the second, about two-thirds as long as the third, the fourth segment deeply emarginate in the middle, at which point it is slightly shorter than the first abdominal segment; greatest vertical diameter of abdomen scarcely more than that of the thorax, venter convex (and without the blackish protuberance shown in Dr. Meinert's figure 2); head sparsely clothed with a short, yellowish-white pubescence, a row of black post-ocular bristles extends from the upper end of each eye to the oral margin, apices of palpi beset with a dense cluster of black bristles; legs beset with short, black, bristly hairs, femora very robust.

Length 1.5 mm.

Type locality, Flagstaff, Arizona. Type No. 6703, U. S. National Museum.

In regard to its habits, Mr. Coquillett gives the following note: "Of its habits nothing is known beyond the fact that it occurred on low vegetation in a locality where no ant-nests could be found, although search was made for them. No stones or rocks occurred in the immediate vicinity, the nearest approach being the small pieces of lava scattered about, but these were too small to conceal an ant-nest."

**ECITOMYIA** Brues.

1901. Brues, American Naturalist, p. 347.

Male. Small, rather slender species. Head with large antennal cavities; antennæ with spherical third joint and apical arista; anterior frontal bristles porrect. Front broader than long, with three

transverse rows besides the four anterior bristles. Proboscis much shorter than the head; palpi bristly. Thorax with one pair of dorsocentral macrochætæ and two marginal scutellar bristles. Wings large, with only a single heavy vein (the third) which is simple at the tip. Costa with fine setæ; reaching to the middle of the wing. Three lighter veins present, the seventh being absent. Legs long and slender, with no longer bristles.

Female. Eyes reduced in size, no larger than the antennæ; ocelli absent. Thoracic dorsum in one piece, the scutellum being absent; with a single pair of dorsocentral bristles. Wings short, finely hairy and reduced to finger shaped appendages which are no longer than the mesonotum. Dorsal abdominal plates reduced, the rest of the abdomen membranous. At the base is a large trapezoidal plate (second segment), followed by three smaller ones of which the last contains the opening of the gland. Legs stouter than in the male, with no bristles except very delicate spurs on the four posterior tibiæ.

This singular genus is represented by only one species, *E. wheeleri* Brues, from Texas. It lives in the nest of the blind driver ant, *Eciton cœcum* Latr.

**Ecitomyia wheeleri** Brues.

American Naturalist, May, 1901, p. 347. Figs.

*Male.* Length .68 mm. Alutaceous, thorax infuscated above. Abdomen piceous on basal three-fourths above, except on the anterior margins of the segments, where it is much paler. Antennæ, palpi, face and legs pale testaceous anterior tibiæ black except at extreme base; hypopygium more or less black, Wings hyaline, veins pale. Costa with very small bristles. The three lighter discal veins almost straight.

*Female.* Length 1.20 mm. Head and thorax yellowish brown, much darkened above. Abdomen yellowish white, its small dorsal plates darker, the first almost piceous. Legs yellowish.

**ACONTISTOPTERA** Brues.

Brues, American Naturalist, xxxvi, 373 (1902).

Head very broad, more than one and one half times as wide as thorax, widest at the front angles; half as long as wide; seen from above regularly arcuate in front, concave behind; front angles sharp, hind ones broadly rounded. Upper surface of head with a small median pair of macrochætæ, eight marginal ones on lateral and posterior edges, one over each eye, a bunch at front angles and a regular series of closely placed ones along the front between the antennæ. Front prolonged over the deep antennal cavity. Thorax small,

greatly narrowed behind; the sides slightly sinuate and the pleuræ partially visible from above owing to the narrowness of the dorsum. Dorsum with a pair of macrochætæ at the anterior angles and a shorter pair posterior to these; also a pair of anterior discal and two pairs of dorsocentral ones. Scutellum very small, with two bristles. Legs rather slender, especially the tarsi, spurs of four posterior tibiæ well developed. Wings short, about the length of the thorax, arcuate. At about the middle the costal bristles suddenly enlarge to form enormous macrochætæ, some of which are more than twice as long as the wing. Abdomen without any indications of segments or sclerites, except the fifth which is small with two macrochætæ and a chitinous ring extending from its posterior edges.

**Acontistoptera melanderi** Brues.

1902. Brues, American Naturalist, xxxvi, 374, figs. 4, 5.

*Female.*—Length 1 mm., of longest wing bristle .4 mm. Light yellow, head darker, fuscous in places, the occiput irregularly lighter, a small yellow circular spot at the insertion of all the macrochætæ. Antennæ, palpi and lower part of the head yellowish white. Thorax but little lighter than the head; wings almost white, their bristles black and very conspicuous, about ten in number. Legs finely black hairy, more deeply colored distally.

Eleven specimens, all from Austin, Texas, March 24th and December 6–7, 1901, in nests of the ant *Eciton opacithorax* Emery.

**XANIONOTUM** Brues.

1902. Brues, American Naturalist, xxxvi, p. 376, figs. 6, 7.

Head broad, one and one half times as wide as the dorsum of the thorax; rounded triangular in shape; twice as wide as long when seen from above. Four macrochætæ on the middle of the front, one on each side half way toward the eye, another just in front of eye, one at posterior angle, a pair of median marginal, and two widely separated discal ones. Antennæ attached at the lower part of their unusually shallow cavities. Ocelli absent. Eyes very small. Cheeks bristly; proboscis nearly as long as head height. Thorax rounded, rather suddenly narrowed behind, much narrower than the head and slightly wider than long. Scutellum very small, without bristles at the anterior angles and with one pair of dorsocentral ones. Legs slender, the tarsi long, tibial spurs of four posterior tarsi well developed. Wings nearly as long as width of thorax, band-shaped and widened at apex, very strongly bristly, the costal bristles longer than the wing. Abdomen with the small dorsal plate of only the fifth seg

ment visible. Gland opening on fifth segment small, with its margin hardly at all thickened; posterior margin of second to fifth segments marked off by wide rows of enormous macrochætæ which extend more than half way across the abdomen. Sexual organs smaller than usual.

This peculiar genus, which is known only in the female sex, is represented by a single species.

**Xanionotum hystrix** Brues.

*Female.*—Length 1.25 mm. Light yellow, almost white, the head much darker above, except an irregular yellowish spot on the vertex, all the large macrochætæ fuscous. Wings with about eleven of the large macrochætæ and each abdominal band consisting of about twenty bristles. Thorax tinged with darker above, especially in front. Legs concolorous with the body, tarsi darker yellow, legs finely black hairy, without stout bristles except one spur each on the tibiæ.

Two specimens, Austin, Texas, March 24, 1901, in nests of the ant *Eciton opacithorax* Em., also another female from the same locality in a nest of *Eciton Schmitti*, May, 1902.

**PULICIPHORA** Dahl.

1897. Dahl, Zool. Anz., xx, p. 410.
1898. Dahl, Sitzungsberichte d. Naturf. Freunde., p. 185.
1898. Dahl, Zool. Anz., xxi, p. 308.
1898. Wandolleck (*Stethopathus*), Zool. Jahrb. Abth. f. Syst., p. 424.
1901. Brues (*Stethopathus*), American Naturalist, May, p. 354.
1903. Melander and Brues (*Stethopathus*), Biological Bulletin, June.

Male. Front with four bristles in an upper row and 2–4 more anterior bristles. Third antennal joint rounded, arista apical. Mediastinal vein distinct; third longitudinal vein simple, not forked; four light wing veins present. Legs long and slender with no bristles except the spurs on the posterior tibiæ. Pulvilli and empodium wanting. No bristles on the posterior wing margin at the base.

Female. Both wings and halteries absent, eyes much reduced, ocelli present. Thorax small, rounded when seen from the side, transverse when seen from above, twice or three times as wide as long. Abdomen elliptical first four dorsal segments strongly chitinized, covering the greater part of the dorsum of the abdomen. Legs stouter than in the male.

Represented by three species, two from the Bismarck Archipelago, and one from the eastern part of the United States.

**Puliciphora occidentalis** M. et B.

1903. Melander and Brues, Biol. Bull., v, 17 (*Stethopathus*).

*Female.*—Length 75 mm. Head rounded triangular, about two-thirds as long as wide, vertex descending rather steeply and evenly. Eyes small, ocelli present. Proboscis long and stout, equal to the head height; palpi small and slender, clavate, with stout macrochætæ. Head with four closely approximated macrochætæ at the middle of the front margin, two widely separated ones near the anterior corner of the eye, and two near the posterior angles of the head; a series of small macrochætæ below and in front of the eye. Thorax small, twice as wide as long, truncate before and behind. Dorsum with a pair of long macrochætæ just behind the humeri and four smaller marginal ones along the posterior edge. Abdomen considerably swollen, but with large and strongly chitinized dorsal plates; the first is only a narrow band, contiguous with the second which is very large and contiguous with the third; fourth and fifth separated by white membrane. Seen from above the abdomen is twice as wide as the thorax and flattened oval in cross section. Glandular opening of the fifth segment in the shape of an arcuate slit. Legs rather stout, the tibiæ with two apical spurs. Testaceous, head and thorax darker above, especially directly above ocelli. Abdominal plates dark fuscous, the membranous parts almost white, with a small fuscous spot at the insertion of each hair.

Type locality, Wood's Hole, Mass.

I have seen only the three type specimens.

**CHONOCEPHALUS** Wand.

1897. Dahl (female of *Puliciphora*), Zool. Anz., xx, 409.
1898. Wandalleck, Zool. Jahrb. Abth. f. Syst. (1898).
1901. Becker, Monog. Phoridæ, p. 86.
1901. Brues, American Naturalist, May, p. 355.

Male. Antennæ in deep cavities, with an apical arista. Front with bristles only along the side margins. Wings very hairy. Costal vein extending past the middle of the wing, with very short bristles. Third longitudinal vein simple, mediastinal and humeral cross vein wanting. Four light wing veins present, the sixth vein with a sigmoid curvature near the base. Legs slender, not bristly except for weak spurs on the posterior tibiæ. Pulvilli and empodium absent.

Female. Head with very small eyes and no ocelli, thorax small, wider than the head but extremely short. Abdomen elliptical, with six strongly chitinized dorsal plates which extend far down on the sides. Sixth ventral plate also present, almost meeting the sixth dorsal.

This genus is known to occur only in the Bismarck Archipelago, where it is represented by a single species, *C. dorsalis* Wand.

**WANDOLLECKIA** Cook.

1897. Cook, Science, vi, 886.
1898. Wandolleck (Cook'sche Gattung), Zool. Jahrb. Abth. f. Syst., 417.
1901. Becker, Monog. Phoridæ, 87.
1901. Brues, American Naturalist, xxv, 339.

Related to *Chonocephalus* Wand. Male winged; female entirely without wings or halteres. Female with very small eyes and no ocelli; thorax small; abdomen with seven segments. Third antennal joint spherical, with an apical arista. Pulvilli pectinated, empodia setiform.

This genus is represented by a single species from West Africa, found upon land snails belonging to the genus *Achatina*. The species has never received a name, and I, therefore, designate it as *W. cooki*, in honor of its discoverer Dr. O. F. Cook.

## GENERA OF UNCERTAIN POSITION.

Under this head I have attempted to group all of the genera which have been too poorly characterized to admit of recognition, or which, for the various reasons set forth under each, will have to be ignored.

**ANEURINA** Lioy.

1864. Lioy Atti, Soc. Veneti., 77.

"Face often with an impressed line. Frontal macrochætæ directed downwards; legs setulose, posterior tibiæ usually very spinose. Wings slightly ciliated on the margin; marginal vein bifurcate at the apex, submarginal reaching to the apex of the wing, arcuate at the base and straight at the extremity; anal vein wanting, median nervure straight."

"The name refers to the absence of the anal vein."

Type, *A. urbana* Meig.

According to Becker, *P. urbana* Meig. possesses four discal veins and the frontal bristles are all reclinate. If such be the case, *Aneurina* cannot be retained as a valid genus, which would be of doubtful propriety, anyhow, even if the diagnosis were correct. This must evidently have been based upon wrongly determined specimens.

**OBELOSIA** Lioy.

1864. Lioy Atti, Soc. Veneti., 77.

"Macrochætæ of the front directed downwards, posterior tibiæ with small spines, intermediate ones bare, with a long terminal spine. Wings ciliated with the marginal vein bifurcate at the ex-

tremity; submarginal reaching the apex of the wing, arcuate at the base straight at the apex. Median nervure straight."

"The name refers to the long spur of the intermediate tibiæ."

Type, *O. rufipennis* Macq.

This genus was based upon an unrecognized species of Macquart, otherwise the diagnosis would apply tolerably well to Aphiochæta (as would also his *Trisometopia*). It seems unwise, however, to resurrect this old name, which is without significance, resting as it does upon an unrecognizable species; and to modify the diagnosis to suit a large group of species since described. This would also involve choosing a new type species for the genus. For this reason I think it had best be discarded.

**DIPLONEURA** Lioy.

1864. Lioy Atti, Soc. Veneti., 77.

"Frontal macrochætæ directed downwards, palpi usually broad; legs setulose, tibia often almost bare; wings with the margin ciliated strongly. Marginal vein bifurcate at the extremity, submarginal reaching to the apex of the wing, arcuate both at the base and apex; median nervure straight."

"The name refers to the furcate marginal vein."

"Types *D. nitidula* Meig., *D. flavea* Meig., *D. atra* Macq."

Of the types chosen for this genus, the first cannot be recognized, and the type of the species does not seem to be extant (Becker, '01. 71). The second belongs to *Phora*, having all the frontal bristles reclinate, and the last, *atra* Macq., is unrecognizable. Hence the generic name can only be a burden, and had best be dropped.

**LISSOMETOPIA** Lioy.

1864. Lioy Atti, Soc. Veneti., 79.

"Front bare, without macrochætæ, legs setulose. Wings ciliated only at the base; marginal vein simple, reaching beyond the middle of the wing, submarginal reaching to the apex of the wing; median nervure straight."

"The name refers to the bare front."

"Type, *L. nudifrons* Macq."

This genus is based upon an unrecognizable species described by Macquart, and as the characters do not apply in their entirety to any present known species or group, it will have to be discarded,

tentatively at least. It resembles *Gymnophora* in the partial absence of the costal bristles but differs by its setulose legs. Possibly if the type species is ever identified, it may be possible to determine the validity of the genus.

It is quite possible that *Platyphora* Verrall may be a synonym of *Lissometopia*, as these two genera are the only ones known to me in which the front is not at all bristly. If this be so then *Lissometopia* has priority over *Platyphora*.

**NEMOSIA** Lioy.

1864. Lioy Atti, Soc. Veneti., 78.

"Frontal macrochætæ directed downwards; vertex with a transverse tubercle, anterior tibiæ with two or four lateral bristles, intermediate ones not ciliated; posterior ones with a lateral bristle. Wings ciliated, with the marginal nervure simple, extending beyond the middle of the wing. Submarginal reaching to the apex of the wing. Median nervure straight."

"The name refers to the occurrence of these insects in forests."

Type, *N. incrassata* Meig.

The generic diagnosis contradicts the descriptions of Meigen and others (see Becker, '01, p. 38) of the species chosen as type, as regards the chætotaxy of the middle tibiæ. As such is the case, the generic name can hardly be applied with propriety to the group which happens to agree with a diagnosis drawn up from an incorrectly determined species as type, and will have to be discarded.*

**HIERONYMUS** Weyenbergh.

1886. Weyenbrgh, Tidschr. Ent., xxix.

Antennæ small, placed low down, almost on the border of the mouth. Proboscis arcuate, strongly hairy, palpi small. Thorax strongly arched and more or less concealing the head. Legs with only short bristles; femora long and slender; tibiæ broad, each with two apical spurs and with bristles. Wings very long and wide; costal vein with short bristles, mediastinal vein not very distinct.

Important characters, translated from Wyenbergh's generic diagnosis.

From the above it is impossible to tell the generic relations of this

* The species designated belongs to *Phora*, and the description applies in its entirety neither to the type species nor to any known group.

form, which is represented by a single species, *H. pygmæus* Wyenb., from Cordova, South America. It is, therefore, omitted from the table of the genera.

**PALLURA** Walker.

1859. Walker, Journal Proceed. Lin. Soc., iii, 127.

Male. Body rather broad, pubescent. Proboscis rather small, withdrawn; antennæ very short, arista very long; scutellum large, conical, extending beyond the base of the abdomen. Abdomen nearly elliptical, no longer than the thorax; legs rather broad, pubescent, without bristles; wings rather long and broad; veins of equal size, costal vein ending at rather before half the length of the wing, cubital ending at hardly in front of the tip, præbrachial ending at a little behind the tip, probrachial ending on the hind border at half the length of the wing; discal transverse vein straight, parted by more than twice its length from the border and from the præbrachial transverse.

This description is worthless as it contains no unique character and omits many of the necessary ones for distinguishing the well known genera. As Becker (1901, 90) has already remarked, it is hard to see what Walker had in mind as distinguishing characters for the genus.

**TERMITOXENIA** Wasmann.

1900. Wasmann, Zeit. Wiss. Zool., lxvii, 4 Heft, pp. 599 617. Plates.
1901. Wasmann, *ibid.*, lxx, 2 Heft, pp. 289 298.

When Wasmann first described this genus (*l. c.*, 1900), he regarded it as related to the forms of wingless Phoridæ for which Wandolleck had just previously erected the family Stethopathidæ and accordingly placed it in this latter family, giving numerous reasons which seemed to justify such a conclusion.

Later, however, at Mik's suggestion, in a second paper (*l. c.*, 1901), Wassmann attempted to remove it entirely from its position near the Phoridæ and assign to it a place near the Muscidæ; not in the Eumyiidæ as Mik suggested, but in a position intermediate between the Muscidæ and the *Pupipara* in the family Termitoxeniidæ. All of the very close similarities which Dahl had pointed out between *Termitoxenia* and the Phoridæ were cast aside as merely "wichtige Aenlichkeiten," while the post embryonic development, which has been only slightly studied, and the shape and position of the antennal cavity were chosen to determine its position. It is so well known as

to scarcely need mention that the post-embryonic devevelopment is not a good character to separate groups, while the shape and position of the antennal cavity are characters which appear in such an endless combination that we are always open to error in attempting an artificial division of groups on such a character.

In my opinion the peculiar antennæ of *Termitoxenia* are enough to prove without a doubt its close relationship to the Phoridæ. The Phoridæ are absolutely unique among the Diptera by the structure of the antennæ which have the second joint enclosed in the third. *Termitoxenia* has exactly similar antennæ, both in shape and structure. We must then consider the two closely related or believe that the similarity is purely accidental, which is scarcely possible. The comb-like rows of bristles upon the metatarsi of *Termitoxenia* are also exactly similar to those of many Phoridæ, in which family the tibiæ and tarsi show a great tendency to bear such rows of hairs. I know of no other Diptera which possess these. Then the shape of the thorax, the form of the legs, with the long free anterior coxæ, the reduction of the wings and the eyes, the swollen abdomen, with a very small first and extremely large second segment, all find their counterparts among certain Phoridæ. The probosis has no doubt been greatly modified to conform with its termitophilous habits.

For these reasons I have included *Termitoxenia* in the present paper. While it may represent a distint family, it is evidently closer to the Phoridæ than to any other Diptera.

## CATALOGUE OF SPECIES.

As many of the generic names used in the present paper are new and necessitate a different arrangement of the species, I have prepared the following catalogue in which the species are segregated in their proper genera. North American species are in the larger type, others in the smaller.

**PHORA** Latr.

pachyneura Loew, Centuries, vii, 97 (1866).
fratercula sp. nov.
thoracia Meig., Class i, 313, 2.
microcephala Loew, Centuries, vii, 96.
spinipes Coq., Canad. Ent., xxvii, 105.
olympiæ sp. nov.
scutellatas sp. nov.
multiseriata sp. nov.
venusta Coq., Canad. Ent., xxvii, 105 (1895).

**comstocki** sp. nov.
**luggeri** Ald., Canad. Ent., xxiv, 125 (1892).
**nitidifrons** sp. nov.
**cimbicis** Aldrich, Canadian Entomologist, xxiv, 143.
**incisuralis** Lw., Centuries, vii, 98.
**divaricata** Ald., Trans. Ent. Soc., London, 1896, pt. iii, 437.
var. **perplexa** var nov.
**grœnlandica** Lundbeck., Særtryk of Vidensk. Med. fra den Naturh. Foren, i, Kjobenhavn, 1900.
*palposa* Zett., Dipt. Scand., vii, 2870, 20.
*opaca* Meig., Beschr., vi, 211.
*nigricornis* Egg., Verhandl. d. k. k. Zool-bot. Ges., xii, 1235.
*lugubris* Syst., Beschr., vi, 217, 17.
*trinervis* Becker, Monog. Phoridæ, 19.
*urbana* Meig., Syst. Beschar., vi, 215, 11.
*fennica* Becker, Monog. Phoridæ, 22.
*abbreviata* v. Roser., Wuertemb. Correspondenzblatt, 1840, 64.
*crassicornis* Meig., Syst. Beschr., vi, 215, 11.
*concinna* Meig., Syst. Beschr., vi, 220, 26.
*bergenstammi* Mik., Verh. d. k. k. Zool-bot., Gesellschaft, 1864, 793.
*maculata* Meig., Syst. Beschr., vi, 214, 7.
*bohemanni* Becker, Monog. Phor., p. 27.
*spinosissima* Strobl, Phoriden Oesterreichs, 162.
*excisa* Becker, Monog. Phor., 28.
*nudipalpis* Becker, Monog. Phor., 29.
*unispinosa* Zett., Dipt. Scand., xiv, 6475.
*dorsalis* Becker, Monog. Phoridæ, 31.
*chlorogastra* Becker, Monog. Phoridæ, 32.
*unicalcarata* Becker, Monog. Phoridæ, 32.
*erythronota* Strobl, Phoriden Oesterreichs, 195, 6.
*curvinervis* Becker, Monog. Phoridæ, 33.
*aptina* Schiner, Fauna d. Adelsb. Grotte. (1863).
*abdominalis* Fall., Dipt. Suec., Phytomyzides, 5, 2.
*strobli* Becker, Monog. Phoridæ, 36.
*autumnalis* Becker, Monog. Phoridæ, 44.
*sorocula* v. d. Wulp. Tidschr. v. Entomol., xiv, 209.
*sinensis* Schiner, Novara Reise Dipt., 224, (1868).

## DORNIPHORA Dahl.

*dorhni* Dahl., S. B. d. naturf. Freunde, 1898, p. 188.

## HYPOCERA Lioy.

**johnsoni** sp. nov.
**ehrmanni** sp. nov.
**femorata** Meig., Syst. Beschr., vi, 213, 5.
**clavata** Lw., Centries, vii, 95.
**mordellaria** Fall., Dipt. Suec. Phytomyzides, 6, 4.
**grenadensis** sp. nov.

*incrassata* Meig., Syst. Beschr.. vi, 212, 1.
*bernuthi* Egg., Verh. d. k. k. Zool-bot. Ges.. 1862, 1234.
*carinifrons* Zett., Dipt. Scand., vii, 2885, 33.
*coronata* Becker, Monog. Phoridæ, 41.
*agilis* Meig., Syst. Beschr., vi. 215, 5.
*citreiformis* Becker, Monog. Phoridæ, 43.
*vitripennis* Meig., Syst. Beschr., vi, 223, 36.

**APHIOCHÆTA** gen. nov.

epeiræ Brues, Psyche, 1902, 351.
pygmæa Zett., Dipt. Scand., vii, 2860.
fasciata Fall., Dipt. Suec. Phytomyzides, 7. 9.
obscura sp. nov.
picta Lehm.. Hamb. Observ., 1822 43.
flava Fall., Dipt. Scand. Phytomyzides, 7. 6.
atlantica sp nov.
lutea Meig., Syst. Beschr., vi, 220.
fungicola Coq., Canad. Ent., xxvii, 106.
nigriceps Lw., Centuries, vii, 99.
scalaris Lw., Centuries, vii, 100.
aurea Ald., Trans. Ent. Soc., London, 1896, 437.
magnipalpis Ald., *l. c.*, 438.
giraudii Egg., Verh. d. k. k. Zool-bot. Ges., 1862, 1235.
halictorum M. et B., Biological Bulletin, June, 1903.
minuta Ald., Canad. Ent., xxiv, 146.
furtiva Ald., Trans. Ent. Soc., London, 1896, 436.
rufipes Meig., Class i, 313, 3.
albidohalteris Felt., 12th N. Y. Report, 228.
agarici Litner, 10th Rept. N. Y. Entomologist, 399.
setacea Ald., Canad. Ent., xxiv, 146.
rostrata M. et B., Biological Bulletin, June, 1903.
pulicaria Fall., Dipt. Suec, Phytonizides, 7, 6.
cata M. et B., Biological Bulletin, June, 1903.
*costalis* v. Roser, Wurtemb. Correspondenzblatt, 1840, 64.
*meigeni* Becker, Monog. Phoridæ, 53.
*melanocephala* v. Roser, Wurtemb. Correspondenzblatt, 1840, 64.
*cubitalis* Becker, Monog. Phoridæ, 56.
*projecta* Becker, *l. c.*, 56.
*ruficornis* Meig., Syst. Beschr., vi, 218, 21.
*zonata* Zett., Ins. Lapp., 796, 6.
*sordida* Zett., *l. c.*, 796, 5.
*humeralis* Zett., *l. c.*, 796, 7.
*pusilla* Meig., Syst. Beschr., vi, 218, 19.
*minor* Zett., Scand., vii, 2864, 13.
*ciliata* Zett., *l. c.*, vii, 2872, 22.
*xanthozona* Strobl., Phoriden Oesterreichs (1893), 203, 27.
*paulmeni* Becker, Monog. Phoridæ, 65.
*umbrimargo* Becker, *l. c.*, 65.
*nudipes* Becker, *l. c.*, 66.

*dahli* Becker, *l. c.*, 67.
*latifemorata* Becker, *l. c.*, 67.
*posticata* Strobl., Wiss. Mitth. Bosnien, vii, 646.
(?) *orientalis* Schiner, Novara Reise Dipt., 224.

**APOCEPHALUS** Coquillett.

pergandei Coq., Proc. Ent. Soc., Washington, iv.
wheeleri sp. nov.

**MELALONCHA.**

*pulchella* sp. nov.
*stylata* Schiner, Navara Reise Diptera, 224 (1868).
? *formicarum* Verrall, Jour. Linn. Soc., xiii, 258.

**TRINEURA** Meig.

aterrima Fabr., Ent. Syst., iv, 334.
velutina Meig., Syst. Beschr., vi, 224.
montana sp. nov.
*schineri* Beck, Monog. Phoridæ, 80.

**CONICERA** Meig.

atra Meig., Syst. Beschr., vi, 226, 1.
var. nêtropica var. nov.
idahoënsis sp. nov. aldrichii
*similis* Haliday, Entom. Monthly Mag., i, 1833, 179.

**GYMNOPHORA** Macquart.

arcuata Meig., Syst. Beschr., vi, 222.

**PACHYNEURELLA** gen. nov.

venata Aldrich, Trans. Ent. Soc., Lond. 1896, 436.

**SYNEURA** gen. nov.

coccinhila Coq., Cand. Ent., xxvii, 106.
? *exempta* Becker, Monog. Phoridæ, 49.

**METOPINA** Macquart.

pachycondylæ sp. nov.
*galeata* Haliday, Ent. Mag., i, 179.

**PSYLLOMYIA** Lw.

*testacea* Loew, Wien. Ent. Montsschr, 1857, 54.

**COMMOPTERA** Brues.

solenopsidis Brues, Amer. Naturalist, May, 1901.

**PLATYPHORA** Verrall.

*bubbocki* Verrall, Journal Linn. Soc., xiii, 259.

**ÆNIGMATIAS** Meinert.

schwartzii Coq., Canad. Ent., xxxv, 20
*blattoides* Meinert, Entom. Meddel., 1890.

**ECITOMYIA** Brues.

wheeleri Brues, Amer. Nat., 1901. 347.

**ACONTISTOPTERA** Brues.

melanderi Brues, Am. Nat., 1902, 373.

**XANIONOTUM** Brues.

hystrix Brues, Am. Nat., 1902, 377.

**PULICIPHORA** Dahl.

occidentalis M. et B., Biological Bulletin, June, 1903.
*lucifera* Dahl., Zool. Anz., 1897. 410.
*pulex* Dahl., SB. der Naturf. Freunde, 1898, 186.

**CHONOCEPHALUS** Wandollek.

*dorsalis* Wand., Zool. Jahrb. Abth. f. Syst., xi, 428.

**WANDOLLECKIA** Cook

*cooki* nom. nov.

**PALLURA** Walker.

*incaria* Walker, Jour. Linn. Soc., iii, 127 (1859).

**HIERONYMUS** Wyenbergh.

*pygmæus* Weyenbergh, Tidschr. Ent., xxix.

**TERMITOXENIA** Wasmann.

Subgenus TERMITOXENIA Wasm.

*harilandi* Wasm., Zeit. Wiss. Zool., lxvii, 609.
*heimi* Wasm., *l. c.*, p. 610.
*assmuthi* Wasm. Zool. Jahrb. Abth. f. Syst., Bd. xvii, Heft i, p. 161.

Subgenus TERMITOMYIA Wasm.

*braunsi* Wasm. Zeit. Wiss. Zool., lxvii, 611.
*mirabilis* Wasm., *l. c.*, p. 610.

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## APPENDIX.

Note 1.—Regarding the use of the generic terms *Phora* and *Trineura*, Prof. Aldrich, with the assistance of Dr. Henshaw, has looked up the matter carefully and come to the following conclusion.

The genus *Phora* was first mentioned by Latreille (Hist. Nat. Crust. et Ins., iii, 464 (1802), where after a brief description of the genus *Phora*, then adds the following: "Exemple. Musca aterrima; putris? F." The *putris* is probably *Themira putris*, but as it is put second and with a query does not affect the real type which is clearly *aterrima*.

Meigen established the genus *Trineura* in 1803 in Illiger's Magazine, one year after Latreille's characterization of *Phora*, with the

same species as type, namely *aterrima*. Seeing, therefore, that *Trineura* was a synonym of *Phora*, some years later (Syst. Beschr., vi, 212), Meigen distinctly says that his *Trineura* is a synonym of *Phora*, which has precedence; it is on this account that he puts all the species under *Phora*, dropping *Trineura* entirely.

From these facts it can be seen that a strict application of the rule of priority would necessitate the removal of *Trineura*. As it would cause needless confusion, however, to restore *Phora* to its proper position at this late date, I have thought it best to follow Becker's recent work and retain *Trineura*.

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## EXPLANATION OF PLATES.

### PLATE V.

Figure 1. *Phora pachyneura* Lw. Wing.
" 2. *Phora pachyneura* Lw. Hypopygium of male.
" 3. *Phora fratercula* sp. nov. Wing.
" 4. *Phora thoracia* Meig. Wing.
" 5. *Phora spinipes* Coq. Wing.
" 6. *Phora spinipes* Coq. Hind tibia.
" 7. *Phora olympiæ* sp. nov.
" 8. *Phora scutellata* sp. nov.
" 9. *Phora multiseriata* sp. nov. Wing.
" 10. *Phora multiseriata*. Hind leg.
" 11. *Phora scutellata* sp. nov. Hind leg.
" 12. *Phora comstocki* sp. nov. Wing.
" 13. *Phora luggeri* Ald. Wing.

### PLATE VI.

" 14. *Phora nitidifrons* sp. nov.
" 15. *Phora cimbicis* Ald. Wing.
" 16. *Phora incisuralis* Lw. Wing.
" 17. *Phora grœnlandica* Lund. Wing. (After Lundbeck.)
" 18. *Hypocera johnsoni* sp. nov. Wing.
" 19. *Hypocera johnsoni*. Head seen from the front.
" 20. *Hypocera ehrmanni* sp. nov. Wing.
" 21. *Hypocera femorata* Meig. Wing.
" 22. *Hypocera clavata* Lw. Hind leg.
" 23. *Hypocera clavata*. Wing.
" 24. *Hypocera grenadensis* sp. nov. Wing.
" 25. *Aphiochæta epiræ* Brues. Wing.
" 26. *Aphiochæta pygmæa* Zett. Wing.
" 27. *Aphiochæta obscusra* p. nov. Wing.

PLATE VII.

Fig. 28. *Aphiochæta picta* Lehm. Wing.
" 29. *Aphiochæta flava* Fall. Wing.
" 30. *Aphiochæta atlantica* sp. nov. Front.
" 31. *Aphiochæta lutea* Meig. Wing.
" 32. *Aphiochæta fungicola* Coq. Wing.
" 33. *Aphiochæta scalaris* Lw. Wing.
" 34. *Aphiochæt anigriceps* Lw. Wing.
" 35. *Aphiochæta aurea* Ald. Wing.
" 36. *Aphiochæta magnipalpis* Ald. Wing.
" 37. *Aphiochæta halictorum* M. et B. Wing.
" 38. *Aphiochæta minuta* Ald. Wings.
" 39. *Aphiochæta furtiva* Ald. Wing.
" 40. *Aphiochæta rufipes* Meig. Wing.

PLATE VIII.

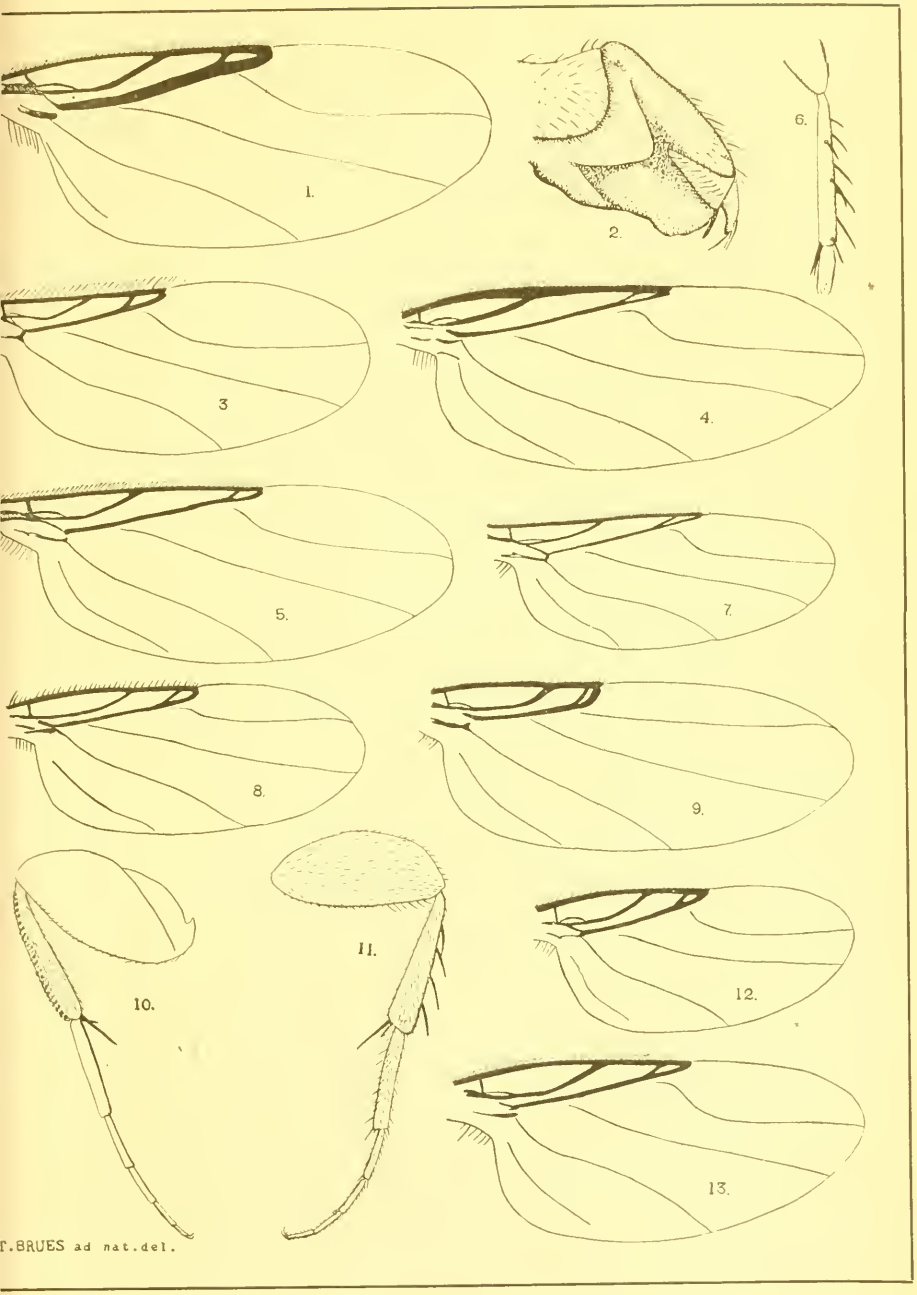
" 41. *Aphiochæta agarici* Lint. Wing.
" 42. *Aphiochæta setacea* Ald. Wing.
" 43. *Aphiochæta rostrata* M. et B. Head viewed from the side.
" 44. *Aphiochæta rostrata.* Wing.
" 45. *Aphiochæta pulicaria* Fall. Wing.
" 46. ? *Aphiochæta* sp. innom. Tip of middle leg of male.
" 47. *Apocephalus pergandei.* Wing.
" 48. *Apocephalus pergandei.* Ovipositor of female, dorsal view.
" 49. *Apocephalus wheeleri* sp. nov. Ovipositor of female, dorsal view.
" 50. *Trineura aterrima* Fabr. Wing.
" 51. *Trineura velutina* Meig. Wing.
" 52. *Trineura montana.* sp. nov. Wing.
" 53. *Trineura montana.* Front leg of male.
" 54. *Conicera aldrichii* sp. nov. Wing.
" 55. *Conicera atra* Meig. Wing.
" 56. *Conicera atra* Meig. Antenna.

PLATE IX.

" 57. *Gymnophora arcuata* Meig. Wing.
" 58. *Pachyneurella venata* Ald. Wing.
" 59. *Pachyneurella venata.* Hypopygium of male.
62 ~~84~~ *Melanloncha pulchella* gen. et sp. nov. Female.
60 Syneura coccipilla Coq.
61 Metopina pachycerdylae Sp. nov.

ERRATA.

Page 336, penultimate line, read *dead* instead of *head of.*
Page 357, the table of species is for the genus *Aphiochæta.*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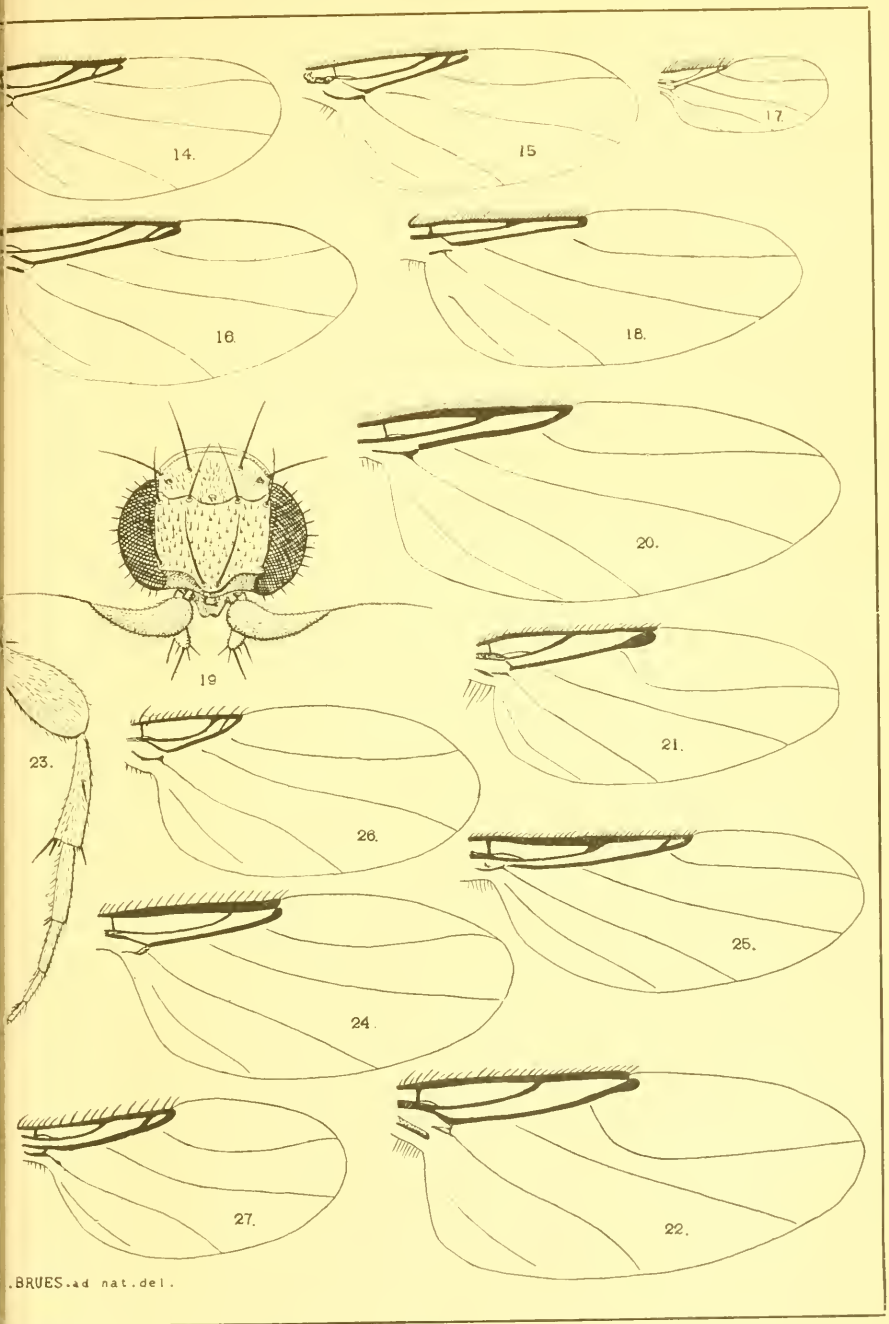
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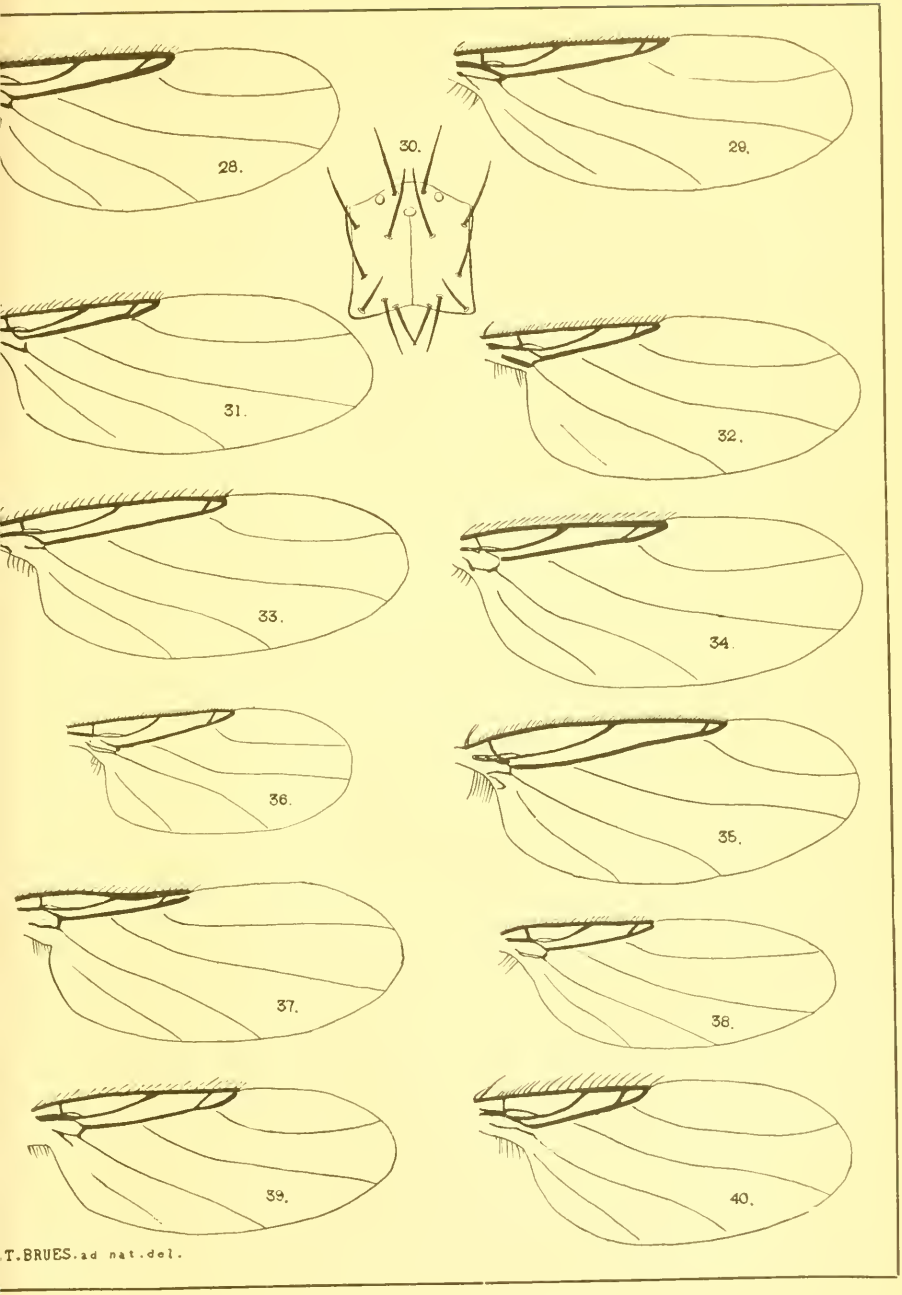
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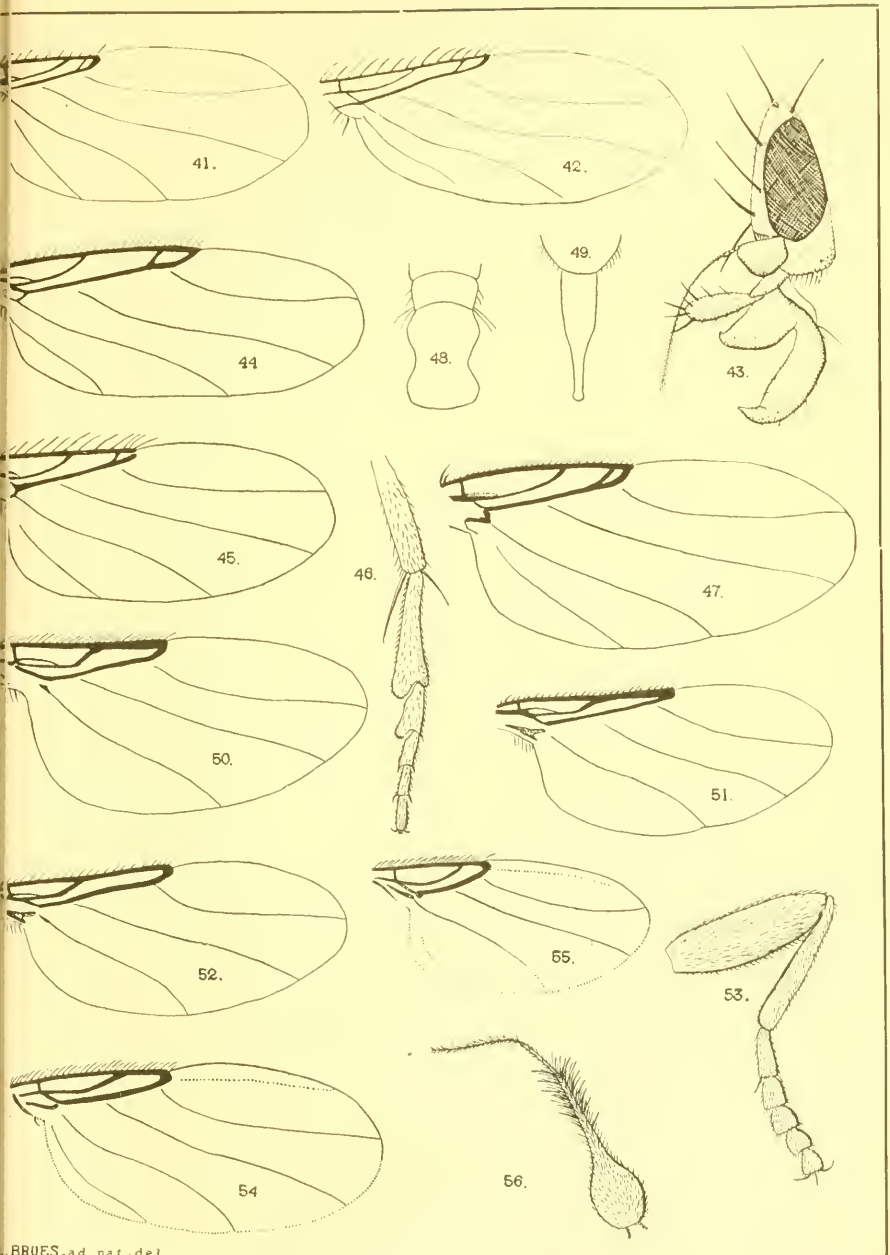
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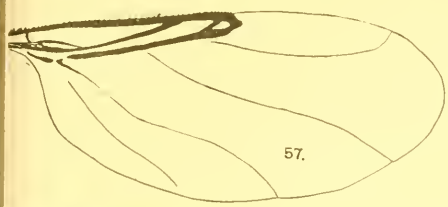
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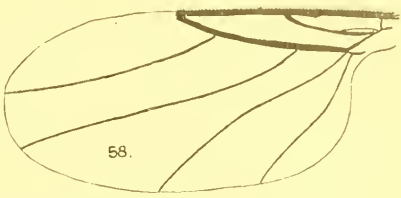
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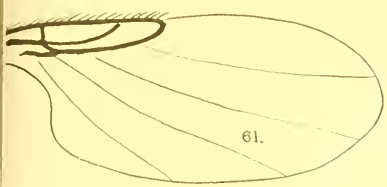
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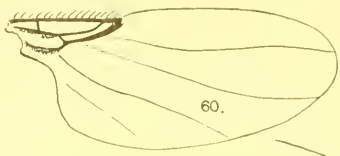
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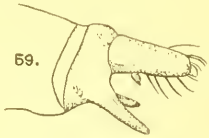
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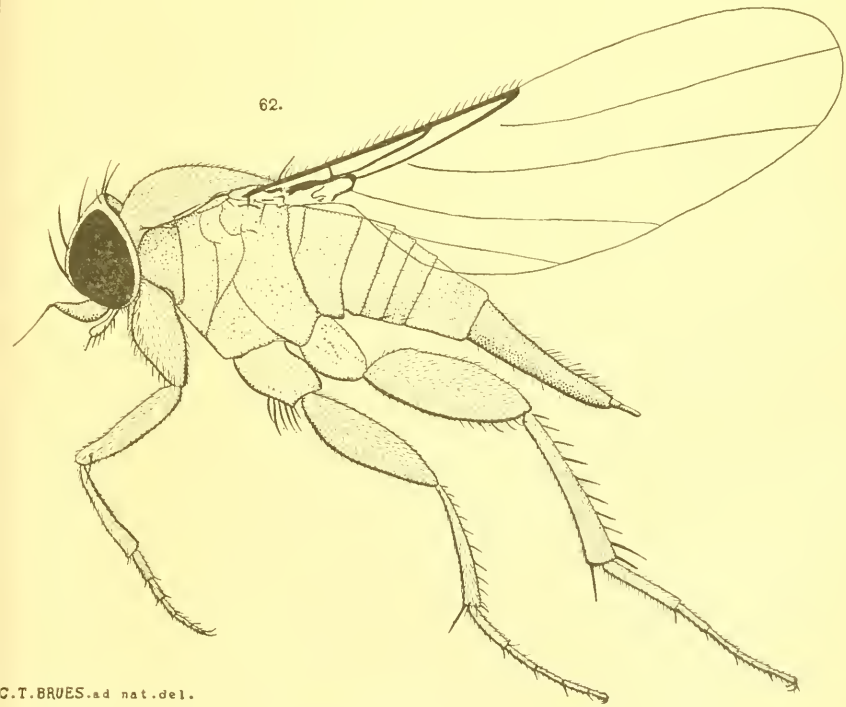

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